WILDLIFE REVIEW

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WILDLIFE REVIEW

An abstracting service for wildlife management
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Fish and Wildlife Service
UNITED STATES DEPARTMENT OF THE INTERIOR

March 1965 Patuxent Wildlife Research Center, Laurel, Maryland No. 117

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Except as indicated, abstracts are by Kenneth J. Chiavetta, editor,
and Paul A. Stewart, assistant editor.

SOILS

Aydelott, D. Gray, and others. SOIL SURVEY OF WAYNE COUNTY, GEORGIA. SCS, Ser. 1961, no. 16. i + 74 p., 7 figs. + single-fold maps based on aerial photos and bound in. Mar. 1965. Sold by Supt. Documents. WR 117: 2
With a section on wildlife and fish.

Elder, John A., and others. SOIL SURVEY OF SAUNDERS COUNTY, NEBRASKA. SCS, Ser. 1959, no. 40. i + 81 p., 30 figs. + single-fold maps based on aerial photos and bound in. Jan. 1965. Sold by Supt. Documents. WR 117: 2
With a section on management for wildlife.

Gorman, John L., and Leonard S. Newman. SOIL SURVEY OF MONROE COUNTY, WEST VIRGINIA. SCS, Ser. 1960, no. 23. i + 114 p., 15 figs. + single-fold maps based on aerial photos and bound in. Feb. 1965. Sold by Supt. Documents. WR 117: 2
With a section on wildlife habitats.

Jacquot, Louis L., and others. SOIL SURVEY OF ARMSTRONG COUNTY, TEXAS. SCS, Ser. 1961, no. 20. i + 80 p., 32 figs. + single-fold maps based on aerial photos and bound in. Feb. 1965. WR 117: 2
With a section on wildlife.

Kennan, Walter E., and others. SOIL SURVEY OF COVINGTON COUNTY, MISSISSIPPI. SCS, Ser. 1961, no. 13. i + 91 p., 5 figs. + single-fold maps based on aerial photos and bound in. Feb. 1965. WR 117: 2
With a section on the use of soils for wildlife and fish.

Koos, William M., and Marvin L. Dixon. SOIL SURVEY OF FOARD COUNTY, TEXAS. SCS, Ser. 1961, no. 14. i + 71 p., 37 figs. + single-fold maps based on aerial photos and bound in. Nov. 1964. Sold by Supt. Documents. WR 117: 2

Larson, E. Joseph. NEW SOIL CLASSIFICATION / WHAT WILL IT MEAN TO THE SOIL SURVEY USER WHEN THE REVISED SYSTEM GOES INTO EFFECT? Soil Conserv. 30(5): 99-102, illus. Dec. 1964. WR 117: 2
[Soil Conserv. Serv., Washington, D. C.] On 1 Jan. 1965, the National Cooperative Soil Survey will start using a new system of soil classification. The new classification will emphasize the present condition of soils rather than their origins. Soil series and types will remain essentially unchanged; changes will come in broader groups and orders. "This new system represents a major advancement in soil science but it will hardly cause a ripple in the day-by-day work of most soil survey users."

Thomas, Grover J., and others. SOIL SURVEY OF WALTON COUNTY, GEORGIA. SCS, Ser. 1961, no. 12. i + 70 p., 15 figs. + single-fold maps based on aerial photos and bound in. Dec. 1964. Sold by Supt. Documents. WR 117: 2
With sections on wildlife and fish and wildlife suitability groups (soils).

Weisenberger, Billy C., and others. SOIL SURVEY OF ELLIOTT COUNTY, KENTUCKY. SCS, Ser. 1961, no. 18. i + 55 p., 4 figs. + single-fold maps based on aerial photos and bound in. Feb. 1965. Sold by Supt. Documents. WR 117: 2
With a section on wildlife.

Wells, R. D., and others. SOIL SURVEY OF MERIWETHER COUNTY, GEORGIA. SCS, Ser. 1961, no. 15. i + 85 p., 9 figs. + single-fold maps based on aerial photos and bound in. Feb. 1965. Sold by Supt. Documents. WR 117: 2
With a section on wildlife and fish.

CONSERVATION EDUCATION

Klimstra, W. D., and Clarence Pratt. WILDLIFE KNOWLEDGE OF SOUTHERN ILLINOIS HIGH SCHOOL STUDENTS. Trans. Ill. State Acad. Sci. 58(1): 70-73. 1965. WR 117: 3

Abstract: A test on wildlife knowledge was given to 593 students in 20 high schools in southern Illinois. An analysis of the performance on various sections of the test was made and comments contributed as a basis for interpretation of the results.

BIBLIOGRAPHIES, DIRECTORIES, BIOGRAPHY, HISTORY

Fischer, Richard B. AMBASSADOR OF BIRDLIFE. Audubon Mag. 67(1): 26-31, illus. Jan.-Feb. 1965. WR 117: 3

[Cornell Univ., Ithaca, N. Y.] A tribute to the late Arthur A. Allen.

PLANTS--GENERAL, ECOLOGY, TECHNIQUES

Heller, R. C., G. E. Doverspike, and R. C. Aldrich. IDENTIFICATION OF TREE SPECIES ON LARGE-SCALE PANCHROMATIC AND COLOR AERIAL PHOTOGRAPHS. USDA, Agr. Handbook no. 261. 17 p., 14 figs. July 1964. Available from Supt. Documents, GPO, Washington, D. C. 30¢. WR 117: 3

A high degree of accuracy was attained in identifying 14 spp. of trees in a boreal forest through the use of color transparencies. Crown and foliage characteristics useful for the identifications are illustrated. Color film was found superior to panchromatic film for use in identifying tree species. With a preliminary training background, an inexperienced interpreter made identifications as accurate as those of interpreters with 20 years of experience.

Labisky, Ronald F., and William L. Anderson. EFFECTS OF MULTIFLORA ROSE HEDGES ON CORN YIELDS IN ADJACENT FIELDS. J. Wildl. Mgmt 29(1): 192-195, 1 fig. Jan. 1965. WR 117: 3

[Ill. Nat. Hist. Surv., Urbana.] Abstract: In east-central Illinois, the presence of multiflora rose (Rosa multiflora) hedges caused a significant reduction, perhaps as much as 25 percent, in the yield of corn (Zea mays) in the first row immediately adjacent to the hedges. Other effects of multiflora rose hedges on yields of corn in fields adjacent to the hedges were insignificant.

PLANTS--FLORAS, COMMUNITIES, TAXONOMY

Yocom, Charles F. SHRUBS OF CRATER LAKE. Crater Lake Nat. Hist. Assoc. 82 p., 32 figs. 1964. WR 117: 3

Eighty-one of the 103 shrubs growing in Crater Lake National Park are discussed and 54 are illustrated.

WILDLIFE--BIOTAS, ECOLOGY, NATURAL HISTORY

Tatarinov, K. A. [CAVES OF THE PODOL'E, THEIR FAUNA AND CONSERVATION.] Okhrana Prirody & Zapovednichie Delo v SSSR 7: 88-101. 1962. [From Biol. Abstr. 45(9), 1964, from Referat. Zhur., Biol., 1963, no. 19I232. Transl. of Russian abstr.] WR 117: 3

WILDLIFE--NATURAL AREAS & REFUGES

Sankhala, K. S. WILDLIFE SANCTUARIES OF RAJASTHAN. J. Bombay Nat. Hist. Soc. 61(1): 27-34 + 2 pls. Apr. 1964. WR 117: 3

Descriptions of the 8 wildlife sanctuaries established in Rajasthan.

WILDLIFE--NATURE PROTECTION & RARE & EXTINCT SPECIES

Edwards, R. Y. PRESERVING NATURE IN PARKS. Blue Jay 22(4): 134-139, illus. Dec. 1964. WR 117: 4
[Dept. Recreation & Conserv., Victoria, British Columbia, Canada.] An eloquent plea for the need of protection of some prairie areas.

WILDLIFE--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION

Smith, J. Maynard. THE EVOLUTION OF ALARM CALLS. Am. Naturalist 99(904): 59-63. Jan.-Feb. 1965. WR 117: 4
[Univ. Coll., London, England.] Summary: The selective forces which can maintain traits such as alarm calls which are individually disadvantageous but socially advantageous are considered. The particular case in which flocks consist of sets of brothers and sisters is analyzed in detail. It is shown that equilibria with intermediate gene frequencies can exist but are unstable; the conditions for stable polymorphism for altruistic traits are briefly discussed.

Sulkava, Seppo. ON THE LIVING CONDITIONS OF THE PARTRIDGE (PERDIX PERDIX L.) AND THE BROWN HARE (LEPUS EUROPAEUS PALLAS) IN OSTROBOTHNIA. Aquilo, Ser. Zool. 2: 17-24, 6 figs. 1965. WR 117: 4
[Univ. Oulu, Oulu, Finland.]

WILDLIFE--EFFECTS OF CHEMICALS, WEATHER, CARS, ETC.

Poole, Sam F., and Wilton Pate. ARASAN-42. Wildl. in N. C. 29(3): 20, illus. Mar. 1965. WR 117: 4
Arasan-42, sometimes called Thiram, effectively repels deer, rabbits, raccoons, and birds for periods of 1-3 months after application.

Stickel, William H., Wendell E. Dodge, William G. Sheldon, James B. DeWitt, and Lucille F. Stickel. BODY CONDITION AND RESPONSE TO PESTICIDES IN WOODCOCKS. J. Wildl. Mgmt. 29(1): 147-155. Jan. 1965. WR 117: 4
[Patuxent Wildl. Res. Center, Laurel, Md.] Abstract: Response of woodcocks (Philohela minor) to heptachlor dosage was closely related to the physical condition of the birds, as reflected by body weight and by body weight in relation to capture weight: in a series of tests with underweight birds, nearly all woodcocks died at dosage levels well below those at which nearly all the birds in a normal-weight series lived. Heptachlor residues in tissues were determined and their loss with time was estimated. Dieldrin proved more toxic than heptachlor to birds of similar weight. Birds in good weight survived massive doses of DDT; some succumbed to smaller spaced serial doses, but only when these were accompanied by starvation rations. When birds were placed in foil-lined boxes after doses of heptachlor added to butter oil or corn oil, it became evident that they passed quantities of oil in about 3 hours, thus very likely ridding themselves of a large part of the heptachlor dose. It was concluded that other methods than dosage with encapsulated chemicals would be needed for appraisal of field effects of toxicants on woodcocks.

Stickel, William H., Don W. Hayne, and Lucille F. Stickel. EFFECTS OF HEPTACHLOR-CONTAMINATED EARTHWORMS ON WOODCOCKS. J. Wildl. Mgmt. 29(1): 132-146. Jan. 1965. WR 117: 4
[Patuxent Wildl. Res. Center, Laurel, Md.] Abstract: The effects on woodcocks (Philohela minor) of eating heptachlor-contaminated earthworms were studied experimentally in a series of feeding trials in Louisiana in the winter of 1960-61. Six of 12 woodcocks fed worms which had been contaminated at an average of 2.86 ppm of heptachlor epoxide died within 35 days; 4 more had died by the fifty-third day, when the other 2 were killed for analysis. Worms from areas in Louisiana treated with 2 pounds of heptachlor per acre often contain more than 3 ppm of heptachlor epoxide. Eleven of 12 woodcocks fed worms contaminated at an average of 0.65 ppm survived the full 60 days of

the experiment; one died on the forty-fifth day, apparently from other causes. All 11 untreated birds survived. Survivors were kept on one-quarter rations of untreated worms for 11 days. Two woodcocks, untreated previously, died during this starvation period. Five previously treated died; two were observed in spasms at death, and these contained 5.9 and 7.2 ppm heptachlor epoxide in their tissues, suggesting that the previous contaminated diet may have influenced mortality, even though the difference between two of nine dying and five of nine dying is not statistically significant. Surviving starved birds given an unrestricted supply of treated or untreated worms for 5 days survived and gained weight. Residues accumulated in their tissues in this time approached levels in birds that died of heptachlor poisoning. Residues in tissues of birds with different histories suggested residue loss at a rate of approximately 2.8 percent per day. Toxicant absorption was estimated to be in the approximate range of 16-20 percent. Residues in birds fed worms containing 0.65 ppm heptachlor epoxide were in the same general magnitude as those in field-caught birds, suggesting a similar average contamination of food supply. Weights and weight changes did not differ significantly between untreated birds and those receiving the lower level of toxicant. Among birds on one-quarter rations, the percentage of weight that could be lost without danger seemed to be near 20 percent. Woodcocks ate 18-208 grams of worms per day (average, 121 grams), representing 11-143 percent (average, 77 percent) of their body weights; birds ate contaminated and uncontaminated food in essentially equivalent amounts. Symptoms of heptachlor poisoning differed considerably between birds.

Wright, Bruce S. SOME EFFECTS OF HEPTACHLOR AND DDT ON NEW BRUNSWICK WOODCOCKS. J. Wildl. Mgmt. 29(1): 172-185, 3 figs. Jan. 1965. WR 117: 5
[NE Wildl. Sta., Fredricton, New Brunswick, Canada.] Abstract: New Brunswick woodcocks (Philohela minor) are subjected to pesticides at both ends of their migration. Heptachlor is applied on the winter and breeding range and 2, 2-bis (p-chlorophenyl)-1, 1, 1-trichloroethane (DDT) on the breeding range. Sample birds were analyzed for residues of these chemicals at seven points in the breeding cycle. The adults arrive on the breeding grounds carrying both pesticides, and the young are already contaminated when hatched. They may acquire more of both during their first summer, and levels of 4.3 ppm HE (heptachlor epoxide, the metabolic product of heltachlor) and 7.0 ppm DDT are reached by fall. Eighty-six percent of the birds examined in fall migration were carrying HE, DDT, or both. The breeding success in the DDT spray zone has been shown to vary inversely with the amount of DDT used and with the area sprayed. When Nova Scotia is used as a control, it has been shown that the birds in the spray zone have a significantly lower breeding success than those outside it. It is concluded that forest spraying with DDT is an important factor in woodcock breeding success and that heptachlor may become a contributing factor in woodcock management by influencing the utilization of the resource.

WILDLIFE--PARASITES & DISEASES

Gray, M. L. INFECTIONS DUE TO LISTERIA MONOCYTOGENES IN WILDLIFE. Trans. 29th N. Am. Wildl. Conf. p. 202-214. 1964. WR 117: 5
[Mont. State Coll., Bozeman.] "The material presented suggests that many different feral hosts may harbor L. monocytogenes, but it does not support the notion that listeric infection is widespread among them. Neither does it give a clear answer to how widely the bacterium may be distributed among wildlife, or the importance of their role in the perpetuation and spread of the disease. Although the disease appears to be self limiting among feral animals, if infected carcasses or carriers are eaten by carnivorous animals or birds these may constitute a further spread for the bacterium."

WILDLIFE--BIOMETRICS

Martinson, R. K., and D. E. Whitesell. BIASES IN A MAIL QUESTIONNAIRE SURVEY OF UPLAND GAME HUNTERS. Trans. 29th N. Am. Wildl. Conf. p. 287-294. 1964. WR 117: 6

[Migratory Bird Populations Sta., Laurel, Md.] Summary: Field records were kept for hunters using the Spring Valley Wildlife Area in Ohio during the 1961-62 hunting season. Questionnaires, asking about hunting trips and upland game killed, were sent to these hunters after the hunting season. Hunting trip and game kill estimates derived from the questionnaire data were higher than the known totals for those items. Comparisons of the data in the field records and the questionnaire data showed that errors attributable to response and non-response inaccuracies occurred in the questionnaire data. Response errors occurred because hunters reported killing more game and making more hunting trips than they actually did; non-response errors occurred because the non-respondents were less persistent in their hunting effort and killed less game than the hunters who did report. These errors resulted in positive biases in the hunting trip and game kill estimates made from the questionnaire data.

WILDLIFE--TECHNIQUES

Adams, Lowell. PROGRESS IN ECOLOGICAL BIOTELEMETRY. BioScience 15(2): 83-86, 155-157. Feb. 1965. WR 117: 6

[Hastings Reservation, Jamesburg Route, Carmel Valley, Calif.] Abstract: The new technique of radio "ecotelemetry" is providing data on location and physiology of free-roaming animals, the weather, and micro-environment: data formerly inaccessible or sparsely available. This permits research in new fields and refinements of old concepts. Ecotelemetry projects in progress are listed, together with a bibliography (appearing on page 155).

Baldwin, Howard A. MARINE BIOTELEMETRY. BioScience 15(2): 95-97, 9 figs. Feb. 1965. WR 117: 6

[Sensory Systems Lab., Tucson, Ariz.] Abstract: Several experiments involving transmission of physiological information by telemetry from untethered marine animals are described. Preliminary data have been obtained to date on depth of dives with pinnipeds. The electrocardiograms of several diving mammals are described as well as instruments for body temperature measurement and transmission of acoustic activity in dolphins. A technique for remote control of olfactory stimulants in freely swimming sharks is mentioned.

Beer, James R. BAIT PREFERENCES OF SOME SMALL MAMMALS. J. Mammal. 45(4): 632-634. Nov. 1964. WR 117: 6

[Univ. Minn., St. Paul.] Of 12 baits tested, a mixture of peanut butter and rolled oats was most effective for use in trapping small mammals. The following mammals were included in the tests: Clethrionomys gapperi, Peromyscus maniculatus, P. leucopus, Microtus pennsylvanicus, Eutamias minimus, Tamias striatus, Blarina brevicauda, Sorex cinereus and S. articus.

Cochran, W. W., D. W. Warner, J. R. Tester, and V. B. Kuechle. AUTOMATIC RADIO-TRACKING SYSTEM FOR MONITORING ANIMAL MOVEMENTS. BioScience 15(2): 98-100, 1 fig. Feb. 1965. WR 117: 6

[279 Nat. Resources Bldg., Urbana, Ill.] Abstract: An automatic radio-tracking system was designed, constructed, and is being used to study the movements of various animals carrying radio transmitters. Two towers spaced 0.5 mile apart support antennas which are continuously rotated at 1-1/3 rpm. The signals received from the transmitters are fed, after amplification and conversion, to a 52-channel receiving and recording system located in a building between the towers. Time and bearing data for up to 52 animals can be continuously recorded on 16-mm film. Bearings are taken from the film, as desired, by an operator using a microfilm reader, and locations are determined by triangulation. Ranges of several miles to the radio-tagged animals and accuracies to the nearest degree are obtainable.

Conference of Biological Editors, Committee on Form and Style. STYLE MANUAL FOR BIOLOGICAL JOURNALS. Second edition. Am. Inst. Biol. Sci. x + 117 p., 4 figs. 1964. Available at $3.00 from American Institute of Biological Sciences, 2000 P Street, NW, Washington, D. C. WR 117: 7

The Committee on Form and Style reviewed the many suggestions received since this useful style manual was published in 1960 [WR 101: 9] and have incorporated the most useful ones in this edition. There are minute changes throughout the text--the most extensive ones appear in the abbreviation of words used in literature citations. These are in keeping with the policy of accepting recognized standards where such exist. A Subcommittee on Periodical Title Abbreviations of the American Standards Association (Sectional Committee Z39 Library Work and Documentation) has a Proposed American Standard for Periodical Title Abbreviations. The Committee on Form and Style has voted to recommend adoption of the proposals for biological journals. More than 80 journals have adopted this manual in whole or in part.

Haahn, Frank. DESIGNING FOR PHYSIOLOGICAL DATA. BioScience 15(2): 112-115, 3 figs. Feb. 1965. WR 117: 7

[E. & M. Instrument Co., Houston, Texas.] Abstract: Basic telemetry systems are described and compared. Design goals for an ideal multi-channel system are compared to present practical systems. Typical recordings from a miniaturized system are shown.

Holgate, Philip. A MODIFIED GEOMETRIC DISTRIBUTION ARISING IN TRAPPING STUDIES. Acta Theriologica 9(20): 353-356. 30 Dec. 1964. In English. WR 117: 7

[Biometrics Sec., Nature Conservancy, 19 Belgrave Square, London S.W.1, England.] If the number of weeks of residence of an animal in a given study area has a geometric distribution, then the length of residence as recorded by a trapping system which does not catch all the animals on every occasion follows a modified geometric distribution.--From summ.

Klett, Evan V. A PORTABLE OBSERVATION TOWER. J. Wildl. Mgmt. 29(1): 206-207, 2 figs. Jan. 1965. WR 117: 7

[Tishomingo Natl. Wildl. Refuge, Tishomingo, Okla.] Abstract: This portable observation tower can be raised or lowered by one person in 10-20 minutes and transported and erected on rough terrain. The observation box is 4 feet square, large enough to hold two observers and their equipment, and can be raised to 10, 14, 18, or 20 feet in height. The entire unit--pipe framework mounted on a boat-trailer chassis--weighs 900 pounds.

Ko, Wen H. PROGRESS IN MINIATURIZED BIOTELEMETRY. BioScience 15(2): 118-120, 6 figs. Feb. 1965. WR 117: 7

[Case Inst. Technol., Cleveland, Ohio.] Abstract: Progress in micro-electronics as well as in the design of miniaturized telemetering transmitters at Case Institute is described. The circuit diagram and the size of the K-4, K-5 transmitters are given. Radio powering of implanted K-5 transmitter is reported.

Munroe, Eugene. BIOSYSTEMATICS AND DYNAMIC ECOLOGY. Royal Ontario Museum, Life Sci. Div., Contrib. no. 59. p. 1-17. 1964. 75¢, from Royal Ontario Museum, Toronto, Ontario. WR 117: 7

Pienkowski, Edward C. PREDICTING TRANSMITTER RANGE AND LIFE. BioScience 15(2): 115-118, 5 figs. Feb. 1965. WR 117: 7

Abstract: With this technique the field biologist should be able to predict and perhaps improve on the range and life of his biotelemetering system. The effects of transmitter power, antenna gain, and intervening terrain are determined from separate graphs so that the experimenter can evaluate the significance of each individual parameter.

Siniff, Donald B., and John R. Tester. COMPUTER ANALYSIS OF ANIMAL-MOVEMENT DATA OBTAINED BY TELEMETRY. BioScience 15(2): 104-108, 4 figs. Feb. 1965. WR 117: 8

[Univ. Minn., Minneapolis.] Abstract: A high-speed digital computer program is described for automatic map construction and distance computations of animal movement data obtained by telemetry. The program is adapted to the University of Minnesota's CDC 1604 in connection with a CDC 160A which furnishes instructions to a X-Y plotter for map construction. A discussion of the program, a flow diagram, and photos of the output are provided. Consideration is given to interpretation of ecological concepts such as activity pattern and home range.

Slagle, A. Karl. DESIGNING SYSTEMS FOR THE FIELD. BioScience 15(2): 109-112, 3 figs. Feb. 1965. WR 117: 8

[RFD 6, Columbia, Mo.] An electronic tracking system, utilizing miniature transmitters, for a raccoon range study is described. Field problems and techniques are discussed.--From abstr.

Tester, John R., and Keith L. Heezen. DEER RESPONSE TO A DRIVE CENSUS DETERMINED BY RADIO TRACKING. BioScience 15(2): 100-104, 5 figs. Feb. 1965. WR 117: 8

[Univ. Minn., Minneapolis.] A drive census had little and only temporary effect on range of movements of two radio-tracked deer.

Wight, Howard M., Robert G. Heath, and Aelred D. Geis. A METHOD FOR ESTIMATING FALL ADULT SEX RATIOS FROM PRODUCTION AND SURVIVAL DATA. J. Wildl. Mgmt. 29(1): 185-192, 2 figs. Jan. 1965. WR 117: 8

[Oreg. State Univ., Corvallis.] Abstract: This paper presents a method of utilizing data relating to the production and survival of a bird population to estimate a basic fall adult sex ratio. This basic adult sex ratio is an average value derived from average production and survival rates. It is an estimate of the average sex ratio about which the fall adult ratios will fluctuate according to annual variations in production and survival. The basic fall adult sex ratio has been calculated as an asymptotic value which is the limit of an infinite series wherein average population characteristics are used as constants. Graphs are provided that allow the determination of basic sex ratios from production and survival data of a population. Where the respective asymptote has been determined, it may be possible to estimate various production and survival rates by use of variations of the formula for estimating the asymptote.

WILDLIFE--MANAGEMENT & RESEARCH, GENERAL

Dambach, Charles A. NEEDED WILDLIFE RESEARCH. Ohio J. Sci. 63(3): 106-112. 1963. [From Biol. Abstr. 45(9), 1964.] WR 117: 8

[Ohio State Univ., Nat. Resources Inst., Columbus.]

Day, Albert M. DEVELOPING FISH AND WILDLIFE RESOURCES THROUGH PUBLIC LAW 566 PROJECTS. Trans. 29th N. Am. Wildl. Conf. p. 112-118, 2 figs. 1964. WR 117: 8

[Pa. Game Comm., Harrisburg.]

Joselyn, G. Blair. WILDLIFE MANAGEMENT ON MILITARY INSTALLATIONS--A CRITIQUE OF ARMY POLICY. J. Wildl. Mgmt. 29(1): 215-224, 1 fig. Jan. 1965. WR 117: 8

[Ill. Nat. Hist. Surv., Urbana.] Abstract: With the Department of Defense controlling increasingly larger segments of land in the United States, civilian conservation agencies have urged natural resource management on military lands. Federal legislation and recent Defense Department policy statements provide a basis for the individual military services to proceed with such wildlife-management programs. Although the Air Force and Navy have

taken positive action to insure adequate long-range wildlife-resource planning, the Army has yet to adopt a similar policy. The Army has recognized the need for wildlife management from only the land-management standpoint and has largely ignored recreational values. Nevertheless, basically sound programs have been developed on a limited number of Army installations, as at Fort Riley, Kansas. The success of the Fort Riley program is attributed to the fact that the value of wildlife-resource management was demonstrated to, and consequently supported by, post authorities; in 1961, only 2 of 13 recreational activities on the installation were more popular than hunting and fishing. Civilian conservation agencies have encouraged the Army to manage the wildlife on the land which it controls and to permit civilian participation in the removal of surplus fish and game. But neither the Army nor civilian conservation agencies have given adequate consideration to the recreational value of fish and game resources on military lands for military personnel. If this fact was recognized, greater progress would be assured in the future.

Myers, Robert E., and Homer E. Stennett. WATERSHED WILDLIFE / ISCHUA CREEK SHOWS HOW LOCAL PEOPLE CAN PROVIDE WIDESPREAD HABITAT. Soil Conserv. 30(4): 75-76, illus. Nov. 1964. WR 117: 9

[SCS, 700 East Water St., Syracuse, N. Y.] The 75,000-acre Ischua Creek watershed in southwestern New York is an example of how residents of a watershed can take advantage of the many opportunities for recreation and wildlife development in a project in cooperation with state and federal agencies.

WILDLIFE--HUNTING AREAS & PROBLEMS

Bakeev, N. N. [THE PRESENT STATUS OF THE STOCKS OF SOME SPECIES OF WILD ANIMALS AND BIRDS IN THE URALS AND THE EXTENT TO WHICH THEY ARE UTILIZED.] In: (Problems of zoological research in Siberia.) Knigoizdat (Gorno-Altaisk.) p. 18-20. 1962. [From Biol. Abstr. 45(11), 1964, from Referat. Zhur., Biol., 1963, no. 20I309. Transl. of Russian abstr.] WR 117: 9

Data are given on the population size and bag of squirrels, muskrats, sables, pine marten, European hare, moose, beaver, roe deer, reindeer, and the game of pine forests.

Carter, Bob. KEEP A WEATHER EYE. Pa. Game News 35(11): 21-25, illus. Nov. 1964. WR 117: 9

With practical suggestions on finding cottontails, ring-necked pheasants, squirrels, and grouse by relating weather conditions to their behavior.

Kolstoe, S. O. WHAT THINK YE OF HUNTING? N. Dak. Outdoors 27(8): 9-11, illus. Feb. 1965. WR 117: 9

[N. Dak. Game & Fish Dept., Bismarck.] "When we talk about capturing and killing for sport, it doesn't seem to have a particularly civilized ring to it," but "the hunter need not be ashamed of his status as a predator. Predation is a provision of nature herself, and it behooves us ill to question her wisdom."

WILDLIFE--PREDATION, CROP DAMAGE, CONTROL

Coleman, Dean. LET'S ABOLISH THE BOUNTY. Colo. Outdoors 14(1): 1-3, illus. Jan.-Feb. 1965. WR 117: 9

"It seems that $19,650 paid on mountain lion bounties in the past eight years could have been put to much better use."

784-441 O-65-2

Laun, H. Charles. THE FEDERAL PROGRAM OF PREDATOR CONTROL IN THE UNITED STATES. A BRIEF HISTORY OF HOW IT OPERATES / ITS OFFICIAL PHILOSOPHY COMPARED WITH PRESENT DAY SCIENTIFIC KNOWLEDGE. Defenders of Wildl. News 40 (1): 37-48, illus. Jan. 1965. WR 117: 10
[Stephens Coll., Columbia, Mo.]

Leopold, A. Starker, Stanley A. Cain, Clarence M. Cottam, Ira N. Gabrielson, and Thomas L. Kimball. THE WAR ON AMERICA'S WILDLIFE. PART II. [FROM A REPORT ON PREDATOR AND RODENT CONTROL IN THE UNITED STATES.] Audubon Magazine 66(5): 307-311, illus. Sept.-Oct. 1964. WR 117: 10
[Univ. Calif., Berkeley.] A continuation of the condensed version of the report listed in WR 115: 12

Potas, Roy. SOUTH DAKOTA LIVESTOCK AND POULTRY LOSSES DURING 1963. S. Dak. Crop & Livestock Reporting Serv. 27 p., illus. [1964.] WR 117: 10
"Death losses of livestock and poultry cost South Dakota farmers and ranchers nearly 19 million dollars in 1963. Predatory animals accounted for a loss of $898,600 or 4.7 percent of the total dollar loss."

Scharf, John. ON LITTLE FOXES--AND--PHEASANTS! Conserv. Volunteer 28(159): 16-21, illus. Jan.-Feb. 1965. WR 117: 10
[R.F.D. 1, Morris, Minn.] "There is not much, if any, correlation between the number of fox and the number of pheasants." Nevertheless, Minn. still pays bounties for foxes.

WILDLIFE--REPORTS OF ORGANIZATIONS & REPORTS OF HARVESTS

Alberta. FIFTEENTH ANNUAL REPORT OF THE DEPARTMENT OF LANDS AND FORESTS... FOR THE FISCAL YEAR ENDED MARCH 31st, 1964. Queen's Printer (Edmonton). 108 p., illus. 1964. WR 117: 10
In the section on wildlife (p. 59-70), there are tabulations by district of upland game bird brood sizes, birds bagged per hunter, species composition of upland game bag, pheasant releases, big game harvest by species and the provincial fur harvest by species for 1963-64.

Indiana. ANNUAL REPORT ISSUE. Outdoor Ind. 8(3): 1-36, illus. Sept. 1964. WR 117: 10
Consists entirely of short reports from the various divisions of the Ind. Dept. Conserv. Pages 22-26 are devoted to a general account of fish and game activities.

Massachusetts. [ANNUAL REPORT, 1963.] Mass. Wildl. 15(1): 1-21, illus. Jan.-Feb. 1964. WR 117: 10
Entire issue devoted to the annual report of the Division of Fish and Game. Included are: a report of the Board, the game program, fisheries program, information and education, land acquisition, and finances. Game harvest, migratory game bird censuses, game stocking, utilization of public hunting areas, damage complaints, operation of checking stations, field trials, and community conservation planning are featured in the game program section.

Massachusetts. [ANNUAL REPORT, 1964.] Mass. Wildl. 16(1): 1-21, illus. Jan.-Feb. 1965. WR 117: 10
Entire issue devoted to annual report of the Mass. Div. of Fisheries and Game. The section on the game program (p. 9-12) includes very brief statements on development of public hunting areas, and game population trends and harvests. One game farm was closed in the interest of economy, but three still remain in operation.

Montana. REPORT OF BIENNIAL ACTIVITIES--MAY 1962-APRIL 1964. Mont. Wildl. 32 p., illus. Summer 1964. WR 117: 11

Pages 8-11 are devoted to game management. The statewide big game, upland game and waterfowl harvest for 1959-1963 are tabulated. Active research projects of the Mont. Coop. Wildl. Res. Unit are listed. The brief discussion covers trends in game populations and general statements on management activities.

New Jersey. ANNUAL REPORT OF THE DIVISION OF FISH AND GAME FOR THE FISCAL YEAR COMMENCING JULY 1, 1963, AND ENDING JUNE 30, 1964. N. J. Dept. Conserv. & Econ. Development. 64 p., illus. [1964.] WR 117: 11

The report of the Bureau of Wildlife Management (p. 30-43) covers game harvests, field trials, state game farms, game liberations, public shooting and fishing grounds, deer management, Ocean Residential Group Center Program, farm game habitat restoration, research activities, forest management, migratory birds, and wildlife control.

North Carolina. [BIENNIAL REPORT / WILDLIFE RESOURCES COMMISSION, JULY 1, 1962-JUNE 30, 1964.] Wildl. in N. C. 29(1): 1-35, illus. Jan. 1965. WR 117: 11

This entire issue is devoted to a biennial report of the N. C. Wildlife Resources Commission. The Division of Game report (p. 17-22) includes sections on small game, waterfowl, wild turkey, big game, forestry, and research.

Saskatchewan. ANNUAL REPORT OF THE DEPARTMENT OF NATURAL RESOURCES...FOR THE FISCAL YEAR ENDED MARCH 31, 1964. Queen's Printer (Regina). 179 p., illus. 1964. WR 117: 11

There are short narrative reports from each of the four divisions of the Wildlife Branch (Fur Management, Game Management, Research, and Statistics). Mostly in tables, information is given covering the following subjects: census of animals on fur farms, types and costs of game licenses, hunting seasons and zones, harvest of ducks and geese, game preserves open during hunting season, firearms accidents, game and fur prosecutions, classification of licenses issued, revenue, value of wild fur pelts, wild fur production, estimated game harvest, and wildlife crop damage insurance.

WETLANDS & WILDLIFE

Fogg, Forrest F. SALT MARSHES OF NEW HAMPSHIRE / ITS PAST, PRESENT AND FUTURE EVALUATION. N. H. Fish & Game Dept. [25 p.], illus. Oct. 1964. WR 117: 11

An appraisal of the benefits gained and lost by draining and filling salt water marshes in N. H. Ten areas were individually considered. Recommendations included preserving areas for bird sanctuaries, public hunting, fishing, and boating, and clam and bait digging. Parking lots and boat ramps were suggested for several areas.

Mackenthun, Kenneth M., William Marcus Ingram, and Ralph Porges. LIMNOLOGICAL ASPECTS OF RECREATIONAL LAKES. Public Health Serv. Publ. no. 1167. xii + 176 p., 11 figs., 52 pls. 1964. Sold by Supt. Documents, GPO, Washington, D. C., at $1.25 (paper cover). WR 117: 11

"The chapters acquaint the reader with the general problem of aquatic nuisances; review the ecology of lakes, reservoirs, and ponds and present information on biotic production, leading to an understanding of the scope and magnitude of the basic nuisance problems; discuss nutrients and their impact on biological growths; review plant and animal pests affecting recreational water and present simple keys for the identification of some common aquatic plants; discuss the mechanics of establishing a sampling program for a lake, reservoir, or pond to determine the present state of biological growths and possibly predict future trends; and present information leading to the control or alleviation of excessive production of biological nuisances."

Mathisen, John, John Byelich, and Robert Radtke. THE USE OF AMMONIUM NITRATE FOR MARSH BLASTING. Trans. 29th N. Am. Wildl. Conf. p. 143-150, 1 fig. 1964. WR 117: 12

[U. S. Forest Serv., Cass Lake, Minn.] Removing dense portions of emergent vegetation from extensive marshes and small potholes has been recognized as a method of habitat improvement for waterfowl and aquatic furbearers. Ammonium nitrate, a common fertilizer, when mixed with fuel oil and detonated with a dynamite primer, has proven to be an inexpensive and effective blasting agent for marsh improvement. It is 1/5 to 1/3 as costly as dynamite and can be used where the use of heavy equipment is not feasible. Techniques and costs are described.--From abstr. by John Mathisen.

Rose, B. J., and H. R. Morgan. A PRIORITY RATING SYSTEM FOR CANADIAN WETLANDS PRESERVATION. Trans. 29th N. Am. Wildl. Conf. p. 249-258, 2 figs. 1964. WR 117: 12

[Natl. Wildl. Federation, Bismarck, N. Dak.] In this paper a system of delineating endangered Canadian waterfowl breeding grounds is described. The soil type or its topographical phase is used as the basic land unit, and a priority rating is assigned to each soil type. Susceptibility to agricultural drainage and filling is considered in the evaluation. Rating tools are as follows: soil texture classification, land utilization classification, natural topography and drainage, precipitation, mean July temperature, number of water areas per square mile, and wetland types. The study indicated those areas which should receive immediate attention in any effort to preserve waterfowl breeding habitat.--From abstr. by B. J. Rose.

RANGELAND & WILDLIFE

Box, Thadis W. CHANGES IN WILDLIFE HABITAT COMPOSITION FOLLOWING BRUSH CONTROL PRACTICES IN SOUTH TEXAS. Trans. 29th N. Am. Wildl. Conf. p. 432-438. 1964. WR 117: 12

[Welder Wildl. Foundation, Sinton, Texas.] "Data from this study show that many individual brush species do not respond the same to similar treatments on different soil types. Likewise, plants of different species on the same soils will differ in response to various treatments. The combination of the dozen or more mechanical brush-control practices now in use in South Texas with the innumerable soil types present offer possibilities for the game manager to manipulate the habitat to obtain the type and density of browse species he desires for the game population concerned."

Dougall, H. W., V. M. Drysdale, and P. E. Glover. THE CHEMICAL COMPOSITION OF KENYA BROWSE AND PASTURE HERBAGE. East African Wildl. J. 2: 86-121. Aug. 1964. WR 117: 12

[Natl. Agr. Res. Sta., Kitale, Kenya.] Tabulations of analyses of vegetation used by herbivorous wildlife and domestic ruminant livestock in Kenya.

STRIPPED LAND & MISCELLANEOUS HABITATS

Smith, H. Granville. SPOILBANKS AND BIRDLIFE / BIRDS COME BACK TO AVONDALE WITH RECOVERY OF VEGETATION ON RECLAIMED STRIP MINES. Soil Conserv. 30(4): 77, illus. Nov. 1964. WR 117: 12

[3920 Martindale Blvd., Columbus, Ohio.] With some observations on bird repopulation of reclaimed spoilbanks.

CONTROL OF VEGETATION WITH HERBICIDES, ETC.

McGilvrey, Frank B., and John H. Steenis. CONTROL OF ALLIGATORWEED IN SOUTH CAROLINA WITH GRANULAR SILVEX. Weeds 13(1): 66-68. Jan. 1965. WR 117: 13

Abstract: Silvex, [2-(2,4,5-trichlorophenoxy)propionic acid], impregnated (20% ae) on clay granules, applied at a rate as low as 20 lb/A ae gave excellent control of well-rooted alligatorweed [Alternanthera philoxeroides (Mart.) Grieb] growing in less than 18 inches of water. The 2-ethylhexyl ester of silvex was more effective than the potassium salt. Silvex was not effective on floating-mat alligatorweed or in water over 18 inches deep.

MAMMALS--GENERAL

Artimo, Atso. VARIATIONS IN SMALL MAMMAL POPULATIONS IN DRY AND DAMP HEATH FORESTS OF SOUTHERN HÄME (S. FINLAND). Aquilo, Ser. Zool. 2: 1-16, 2 figs. 1965. WR 117: 13

Clethrionomys glareolus made up 82% of catch, followed by Sorex araneus, 12%. In the dry heath forests of low trophic level the catches were smaller than in the damp heath forests.--From summ.

Banks, Richard C. WEIGHT CHANGE IN FROZEN SPECIMENS. J. Mammal. 46(1): 110. Feb. 1965. WR 117: 13

[Nat. Hist. Museum, San Diego, Calif.] Differences in weights of small mammals weighed immediately after collection and after being in refrigeration 1-3 months were no greater than "would be obtained if the animals were weighed several times successively or by different persons."

Dunaway, Paul B., and Lovell L. Lewis. TAXONOMIC RELATION OF ERYTHROCYTE COUNT, MEAN CORPUSCULAR VOLUME, AND BODY-WEIGHT IN MAMMALS. Nature 205 (4970): 481-484, 1 fig. 30 Jan. 1965. WR 117: 13

[Oak Ridge Natl. Lab., Oak Ridge, Tenn.] Studies of shrews, bats and rodents of the Oak Ridge area.

Howard, D. A. THE COPPER CONTENT OF THE LIVER OF SOME GAME ANIMALS IN KENYA. East African Wildl. J. 2: 47-50. Aug. 1964. WR 117: 13

[Vet. Res. Lab., Kabete, Kenya.] Liver copper levels were generally higher and more varied among mammals with complex stomachs than among those with simple stomachs.

Jones, J. Knox, Jr., and David H. Johnson. SYNOPSIS OF THE LAGOMORPHS AND RODENTS OF KOREA. Univ. Kans. Publ., Museum Nat. Hist. 16(2): 359-407. 12 Feb. 1965. WR 117: 13

Kucheruk, V. V. [THE SIGNIFICANCE OF BURROWS AND BURROWING ACTIVITY OF MAMMALS IN THE EVOLUTION, DISTRIBUTION AND CURRENT EXISTENCE OF ANIMALS AND PLANTS IN ARID REGIONS OF THE PALEARCTIC.] Voprosy Ekologii (Kiev) 4: 46-48. 1962. [From Biol. Abstr. 45(11), 1964, from Referat. Zhur., Biol., 1963, no. 9D5. Transl. of Russian abstr.] WR 117: 13

Kunicki-Goldfinger, Władysław, and Władysława Kunicka-Goldfinger. SEASONAL VARIATIONS OF SOME HAEMATOLOGICAL VALUES IN SMALL MAMMALS LIVING IN NATURAL ENVIRONMENT. Acta Theriologica 9(11): 149-164, 7 figs. 30 Nov. 1964. In English with Polish summ. WR 117: 13

[Warsaw Univ., Warsaw, Nowy Świat 67, Poland.] Seasonal fluctuations were observed in hemoglobin concentration and erythrocyte count in Sorex araneus and Clethrionomys glareolus. Dietary factors and endocrine gland activity were suggested as the chief causes of changes in hemoglobin concentration. Metabolic activity and partial oxygen pressure in the animal's environment appeared responsible for changes in the erythrocyte count.--From summ.

MAMMALS--GENERAL--Continued

Maksimov, A. A. [THE ECOLOGIC-EPIZOOTIC CONNECTION BETWEEN THE MUSKRAT AND THE WATER RAT.] In: (The acclimatization of animals in the USSR.) Akad. Nauk Kazakhsk. SSR (Alma-Ata). p. 351-354. 1963. [From Biol. Abstr. 45(12), 1964, from Referat. Zhur., Biol., 1963, no. 20I273. Transl. of Russian abstr.] WR 117: 14

Tucker, Richard. CONTRIBUTIONS TO THE BIOMECHANICS OF THE VERTEBRAL COLUMN. II. ROTATORY SYSTEM INDUCED IN THE THORACO-LUMBAR CURVATURE BY THE EPAXIAL MUSCULATURE. Acta Theriologica 9(13): 171-192, 24 figs. 30 Nov. 1964. In English with Polish summ. WR 117: 14
[Univ. Queensland, Brisbane, Australia.]

Voronov, G. A., and N. F. Reimers. [THE DISTRIBUTION AND BIOLOGY OF INSECTIVORES AND RODENTS ON THE TAIGA OF THE UPPER LENA RIVER.] Dokl. Inst. Geog. Sibiri & Dal'nogo Vost. 2: 35-46. 1962. [From Biol. Abstr. 45(11), 1964, from Referat. Zhur., Biol., 1963, no. 18I208. Transl. of Russian abstr.] WR 117: 14

MAMMALS--POPULATIONS, HOME RANGES, COMMUNITIES

Golley, Frank B., John B. Gentry, Larry D. Caldwell, and Leslie B. Davenport, Jr. NUMBER AND VARIETY OF SMALL MAMMALS ON THE AEC SAVANNAH RIVER PLANT. J. Mammal. 46(1): 1-18, 5 figs. Feb. 1965. WR 117: 14
[Savannah River Ecol. Lab., S.R.O.O., Aiken S. C.] Twelve species were trapped in 86,000 trap-nights. Cotton rats (Sigmodon hispidus) were captured in the greatest variety of habitats and showed the greatest range in abundance within habitats. Cotton mice (Peromyscus polionotus) showed little variation in numbers trapped in different habitats occupied by the species.

Gottschang, Jack L. WINTER POPULATIONS OF SMALL MAMMALS IN OLD FIELDS OF SOUTHWESTERN OHIO. J. Mammal. 46(1): 44-52. Feb. 1965. WR 117: 14
[Univ. Cincinnati, Cincinnati, Ohio.] In 17,975 trap-nights 789 small mammals of 11 spp. were captured in 8 counties of southwestern Ohio. The distribution of the captures in regard to species, county, and month was discussed. There appeared to be a "crash" in the population of Blarina brevicauda during the winter of 1962-63.

MAMMALS--FAUNAS AND MANUALS

Banks, Richard C. THE MAMMALS OF CERRALVO ISLAND, BAJA CALIFORNIA. Trans. San Diego Soc. Nat. Hist. 13(20): 397-404. 30 Dec. 1964. WR 117: 14
[San Diego Nat. Hist. Museum, San Diego, Calif.]

Paul, John R., and Thomas L. Quay. NOTES ON THE MAMMALIAN FAUNA OF THE TOXAWAY RIVER GORGE, NORTH CAROLINA. J. Elisha Mitchell Sci. Soc. 79(2): 124-126. 1963. [From Biol. Abstr. 45(9), 1964.] WR 117: 14
[State Coll., Raleigh, N. C.]

MAMMALS--PARASITES AND DISEASES

Goldenberg, Martin I., Stuart F. Quan, and Bruce W. Hudson. THE DETECTION OF INAPPARENT INFECTIONS WITH PASTEURELLA PESTIS IN A MICROTUS CALIFORNICUS POPULATION IN THE SAN FRANCISCO BAY AREA. Zoonoses Res. 3(1): 1-13. Apr. 1964. WR 117: 14
[Public Health Serv., San Francisco, Calif.] Eight of 379 seemingly healthy California voles carried infections of Pasteurella pestis. Two voles found dead in the field were also infected.--From abstr.

Hudson, Bruce W., Stuart F. Quan, and Martin I. Goldenberg. SERUM ANTIBODY RESPONSES IN A POPULATION OF MICROTUS CALIFORNICUS AND ASSOCIATED RODENT SPECIES DURING AND AFTER PASTEURELLA PESTIS EPIZOOTICS IN THE SAN FRANCISCO BAY AREA. Zoonoses Res. 3(1): 15-29, 5 figs. Apr. 1964. WR 117: 15
[Public Health Serv., San Francisco, Calif.]

Lawrence, William H., Kirby L. Hays, and S. A. Graham. ARTHROPODOUS ECTOPARASITES FROM SOME NORTHERN MICHIGAN MAMMALS. Univ. Mich. Occas. Papers Museum Zool. no. 639. p. 1-7. 11 Feb. 1965. WR 117: 15
[Weyerhaeuser Co., Centralia, Wash.] Summary: Collections of ectoparasites from twenty-six species of mammals in the Upper Peninsula of Michigan show that these animals harbor the following ectoparasites: 8 species of ticks (notes included on the rediscovery of Ixodes banksi Bishopp and its role as a potential vector of tularemia), 11 species of laelaptiod mites, 3 species of hair mites, 7 species of chiggers, 2 species of Myobidae, 1 species of Pyemotidae, 7 species of sucking lice, 5 species of chewing lice, 18 species of fleas, 1 species of Cimicidae, 2 species of beetles, and 2 species of warble flies.

Mohr, Carl O., and William A. Stumpf. LOUSE AND CHIGGER INFESTATIONS AS RELATED TO HOST SIZE AND HOME RANGES OF SMALL MAMMALS. Trans. 29th N. Am. Wildl. Conf. p. 181-195, 2 figs. 1964. WR 117: 15
[Univ. Calif., Berkeley.] Mammals of a total head and body length of less than 6 cm were usually free of Anoplura, and those of less than 11 cm length were free of Mallophaga. Large male Microtus californicus supported more Anoplura than large females. Infestations of chiggers involved more of the larger mice with larger home ranges than of the smaller mice with smaller home ranges. Anoplura and Mallophaga are known to occur on the same host in mammals as large as guinea pigs but not on mice.--From abstr. by Carl O. Mohr.

Sealander, John A. THE INFLUENCE OF BODY SIZE, SEASON, SEX, AGE AND OTHER FACTORS UPON SOME BLOOD PARAMETERS IN SMALL MAMMALS. J. Mammal. 45(4): 598-616, 3 figs. Nov. 1964. WR 117: 15
[Univ. Ark., Fayetteville.] Covers one race each of Sigmodon hispidus and Reithrodontomys fulvescens, two races each of Tamias striatus, Oryzomys palustris and Peromyscus leucopus, and three races of Peromyscus maniculatus.

Sweatman, G. K., and R. J. Williams. WILD ANIMALS IN NEW ZEALAND AS HOSTS OF ECHINOCOCCUS GRANULOSUS AND OTHER TAENIID TAPEWORMS. Trans. Roy. Soc. New Zealand Zool. 2(26): 221-250, illus. 1962. [From Biol. Abstr. 45(12), 1964.] WR 117: 15
[Dept. Trop. Health, Am. Univ. Beirut, Beirut, Lebanon.]

SHREWS, MOLES, BATS

Buchalczyk, Anna, and Zofia Korybska. VARIATION IN THE WEIGHT OF THE BROWN ADIPOSE TISSUE OF SOREX ARANEUS LINNAEUS, 1758. Acta Theriologica 9(14): 193-215, 6 figs. 30 Nov. 1964. In English with Polish summ. WR 117: 15
[Mammals Res. Inst., Bialowieza, Poland.] The greatest weights of brown adipose tissue (BAT) occurred in young shrews in May and June, immediately after the animals left the nest. Weight of BAT in young males remained at a nearly constant level from July to Dec. and was lower in males than females, except in Oct. In July there was a decline in weight of BAT in adults. Increase in BAT and general body weight showed close positive correlation in the spring.

Cockrum, E. Lendell, and Stephen P. Cross. TIME OF BAT ACTIVITY OVER WATER HOLES. J. Mammal. 45(4): 635-636. Nov. 1964. WR 117: 15
[Univ. Ariz., Tucson.] Peak activity occurred in the early evening, with a lesser peak occurring somewhat later.

Cross, Stephen P., and William Huibregtse. UNUSUAL ROOSTING SITE OF EPTESICUS FUSCUS. J. Mammal. 45(4): 628. Nov. 1964. WR 117: 16
[Univ. Ariz., Tucson.] Bats (15-20) were observed emerging from cavities in a giant saguaro (Carnegiea giganteus) during the evening.

Davis, Russell, and E. Lendell Cockrum. EXPERIMENTALLY DETERMINED WEIGHT LIFTING CAPACITY IN INDIVIDUALS OF FIVE SPECIES OF WESTERN BATS. J. Mammal. 45(4): 643-644. Nov. 1964. WR 117: 16
[Univ. Ariz., Tucson.] Experimental flight loads were as much as 73.3% of the body weight. Tests were made with the following species: Macrotus californicus, Antrozous pallidus, Tadarida brasiliensis, Myotis velifer, Plecotus townsendi.

Davis, Wayne H. WINTER AWAKENING PATTERNS IN THE BATS MYOTIS LUCIFUGUS AND PIPISTRELLUS SUBFLAVUS. J. Mammal. 45(4): 645-647. Nov. 1964. WR 117: 16
[Univ. Ky., Lexington.] All of 20 wintering Myotis lucifugus changed locations in their cave within 3 weeks after being first checked in 9 Feb.; of 20 Pipistrellus subflavus, 10 still occupied their same positions at the end of 8 weeks after 9 Feb.

Davis, Wayne H., Marion D. Hassell, and Michael J. Harvey. MATERNITY COLONIES OF THE BAT MYOTIS L. LUCIFUGUS IN KENTUCKY. Am. Midland Nat. 73(1): 161-165, 1 fig. Jan. 1965. WR 117: 16
[Univ. Ky., Lexington.] Abstract: The distribution of Myotis lucifugus lucifugus is discussed and the first known maternity colonies from Kentucky are reported. Three colonies examined contained much higher proportions of adult males than are found in northern colonies. Parturition dates ranged from May 21 to beyond June 21. Banding recoveries of distances up to 35 miles are reported. Maternity colonies of M. lucifugus appear to be scarce and local but widely distributed in Kentucky.

DeBlase, Anthony F., Stephen R. Humphrey, and K. Susan Drury. CAVE FLOODING AND MORTALITY IN BATS IN WIND CAVE, KENTUCKY. J. Mammal. 46(1): 96. Feb. 1965. WR 117: 16
[Earlham Coll., Richmond, Ind.] Of the 1343 dead bats counted, 597 were banded (564 Myotis lucifugus, 31 M. sodalis, 3 Pipistrellus subflavus and 2 unidentified.) This mortality was due to flooding and represented 20% of the winter population.

Harrison, Jean Burch. TEMPERATURE EFFECTS ON RESPONSES IN THE AUDITORY SYSTEM OF THE LITTLE BROWN BAT MYOTIS L. LUCIFUGUS. Physiol. Zoöl. 38(1): 34-48, 4 figs. Jan. 1965. WR 117: 16
[Harvard Univ., Boston, Mass.]

Jones, Clyde J. DISTRIBUTION AND ECOLOGY OF THE BATS OF THE MOGOLLON MOUNTAINS AREA. Ph.D. thesis, Univ. N. Mex. 117 p. 1964. [From abstr. in Dissertation Abstr. 25(8), 1965.] WR 117: 16
On the distribution, ecology, natural history and the factors influencing the distribution and activity of bats of this area in SW New Mexico and SE Arizona.

Lutz, John Ewald. NATURAL HISTORY OF THE SHORT-TAILED SHREW IN SOUTHEASTERN MICHIGAN. Ph.D. thesis, Univ. Mich. 354 p. 1964. [From abstr. in Dissertation Abstr. 25(6), 1964.] WR 117: 16
With comments on molt patterns, previously undescribed non-glandular heel organ, senses, vocalizations, habitat, reproductive physiology, home range, population density, food habits, and daily and seasonal activity patterns of Blarina brevicauda.

Mitchell, Henry A. INVESTIGATIONS OF THE CAVE ATMOSPHERE OF A MEXICAN BAT COLONY. J. Mammal. 45(4): 568-577, 3 figs. Nov. 1964. WR 117: 17
[Univ. Mo., Kansas City.] Ammonia gas levels did not reach lethal limits for humans although concentrations were sufficient to produce extreme respiratory distress and caustic effects in man and to bleach hair pigments of bats. Bleaching conditions existed from early summer to early fall. During this period there was little or no ventilation of cave atmosphere due to animal flight or other cause.--From abstr.

Myers, Richard Frey. ECOLOGY OF THREE SPECIES OF MYOTINE BATS IN THE OZARK PLATEAU. Ph.D. thesis, Univ. Mo. 250 p. 1964. [From abstr. in Dissertation Abstr. 25(7), 1965.] WR 117: 17
The purpose of this study was to learn of the size of Ozark bat populations, define habitats, ascertain sex ratios and describe seasonal patterns of movement of Myotis lucifugus, M. sodalis, and M. grisescens. Of the 50,118 banded bats, 12.5% were retaken; 9.9% at the site where banded and 2.6% elsewhere. Censuses of bats in the Ozarks since 1954 indicate that the population of M. grisescens has remained stable, but numbers of hibernating M. sodalis and M. lucifugus have been greatly reduced in most caves in central Missouri. These losses are attributed to the increase in human disturbance.

Pokrovskii, V. S., and Yu. M. Shchadilov. [THE STATUS OF KNOWLEDGE ON MIGRATIONS OF THE BAT IN THE USSR (BASED ON DATA OF RINGING).] Migratsii Zhivotnykh. Akad. Nauk SSSR (Moscow) 3: 10-20. 1962. [From Biol. Abstr. 45 (9), 1964, from Referat. Zhur., Biol., 1963, no. 19I162. Transl. of Russian abstr.] WR 117: 17
Based on studies of 11,593 bats of 23 spp. banded during 1938-1959.

Pucek, Zdzisław, and Georgi Markov. SEASONAL CHANGES IN THE SKULL OF THE COMMON SHREW FROM BULGARIA. Acta Theriologica 9(20): 363-366, 1 fig. 30 Dec. 1964. In English. WR 117: 17
[Polish Acad. Sci., Mammals Res. Inst., Bialowieza, Poland.]

Sorenson, Marion Wesley. THE BEHAVIOR OF TREE SHREWS IN CAPTIVITY. Ph.D. thesis, Univ. Mo. 238 p. 1964. [From abstr. in Dissertation Abstr. 25(7), 1965.] WR 117: 17
The author concludes (after a 21 months' study of 71 tree shrews of 5 spp.) that tree shrews should be classified as Primates not as Insectivora.

Stones, Robert C., and Jacob E. Wiebers. ACTIVITY AND BODY WEIGHT OF MYOTIS LUCIFUGUS AT A LOW TEMPERATURE. J. Mammal. 46(1): 94-95, 1 fig. Feb. 1965. WR 117: 17
[Mich. Technol. Univ., Houghton.]

Stones, Robert C., and Jacob E. Wiebers. SEASONAL CHANGES IN FOOD CONSUMPTION OF LITTLE BROWN BATS HELD IN CAPTIVITY AT A "NEUTRAL" TEMPERATURE OF 92°F. J. Mammal. 46(1): 18-22, 2 figs. Feb. 1965. WR 117:17
[Mich. Technol. Univ., Houghton.] Abstract: Little brown bats, Myotis lucifugus, were maintained on a diet of mealworms in captivity throughout most of one year at a neutral temperature of 92°F. An attempt was made to maintain constant body weights of bats within the normal range of those in nature. Under these conditions, seasonal and sex variations in food consumption were observed. Major differences in food consumption were thought to result from a shift in the zone of thermal neutrality and alterations in the female reproductive cycle. Food consumption and body weight in M. lucifugus appear to follow a seasonal cycle under constant laboratory conditions.

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Tamsitt, J. R., and Darío Valdivieso. THE MALE REPRODUCTIVE CYCLE OF THE BAT ARTIBEUS LITURATUS. Am. Midland Nat. 73(1): 150-160, 1 fig. Jan. 1965. WR 117: 18

[Univ. Puerto Rico, San Juan.] Abstract: Reproductive activity of males of the tropical frugivorous bat, Artibeus lituratus, was investigated in west central Colombia for a 17-month period during 19611963. The climate of the area varied little throughout the study period, and climatic conditions did not influence reproductive activity in males. Data based on presence of sperm, length and tubule diameter of the testis and diameter of the epididymis indicate that males are capable of reproductive activity at any time of the year, and the reproductive pattern is acyclic without suggestions of seasonal variations.

Tamsitt, J. R., Darío Valdivieso, and Jorge Hernández-Camacho. BATS OF THE BOGOTA SAVANNA, COLOMBIA, WITH NOTES ON ALTITUDINAL DISTRIBUTION OF NEOTROPICAL BATS. Rev. Biol. Tropical 12(1): 107-115. 1964. WR 117: 18

[Univ. Puerto Rico, San Juan.] An annotated list of 10 spp.

Tigges, Johannes. UNTERSUCHUNGEN ÜBER DEN FARBENSINN VON TUPAIA GLIS (DIARD 1820). [INVESTIGATIONS OF THE COLOR SENSE OF TUPAIA GLIS (DIARD 1820).] Z. Morphol. & Anthropol. 53(1/2): 109-123, illus. 1963. [From Biol. Abstr. 45(11), 1964. In German with English summ.] WR 117: 18

[Max-Planck-Inst. Hirnforsch., Giessen, West Germany.] Abstract: One female and three male tree shrews were tested regarding ability to distinguish two or four colors. Red, yellow, green and blue were significantly discriminated from gray paper which included 62 steps between white and black. The light illuminating the papers was more than two lux. Hence Tupaia glis has a well developed color sense.

Tomilin, A. G. [SOME OBSERVATIONS ON THE MOLES OF THE MOSCOW AREA.] Trudy Vses. Sel'skokhoz. Inst. Zaochnogo Obrazovaniya 10: 81-86. 1962. [From Biol. Abstr. 45(9), 1964, from Referat. Zhur., Biol., 1963, no. 18I200. Transl. of Russian abstr.] WR 117: 18

RABBITS AND PIKAS

Asahi, Minoru. ECOLOGY AND SOCIAL INTEGRATION OF DOMESTIC RABBITS, INTRODUCED INTO A SMALL ISLET. J. Biol. Osaka City Univ. 13: 119-160, illus. 1962 (1963). [From Biol. Abstr. 45(10), 1964.] WR 117: 18

Borowski, Stanisław. STUDIES ON THE EUROPEAN HARE. I. MOULTING AND COLORATION. Acta Theriologica 9(15): 217-231, 4 figs. 30 Dec. 1964. In English with Polish summ. WR 117: 18

[Polish Acad. Sci., Mammals Res. Inst., Białowieża, Poland.]

Bujalska, Gabriela. STUDIES ON THE EUROPEAN HARE. IV. VARIATIONS IN THE PELVIS AND SACRUM. Acta Theriologica 9(18): 287-304, 3 figs. + 2 pls. 30 Dec. 1964. In English with Polish summ. WR 117: 18

[Polish Acad. Sci., Mammals Res. Inst., Białowieża, Poland.]

Cabon-Raczyńska, Krystyna. STUDIES ON THE EUROPEAN HARE. II. VARIATIONS IN THE WEIGHT AND DIMENSIONS OF THE BODY AND THE WEIGHT OF CERTAIN INTERNAL ORGANS. Acta Theriologica 9(16): 233-248, 1 fig. 30 Dec. 1964. In English with Polish summ. WR 117: 18

[Polish Acad. Sci., Mammals Res. Inst., Białowieża, Poland.] Young hares (Lepus europaeus) attain a weight matching adults by Feb. or Mar. after birth. Heart and body weights increase at the same rate and maintain the same weight relationship. The kidneys increase in weight at a slightly slower rate than the body and represent a smaller part of the body weight in adults than in young. Weight of the liver relative to body weight also decreases with body growth.

Caboń-Raczyńska, Krystyna. STUDIES ON THE EUROPEAN HARE. III. MORPHOLOGICAL VARIATION OF THE SKULL. Acta Theriologica 9(17): 249-285, 5 figs. 30 Dec. 1964. In English with Polish summ. WR 117: 19
[Polish Acad. Sci., Mammals Res. Inst., Białowieża, Poland.]

Carson, James D., and Dan E. Cantner. WEST VIRGINIA COTTONTAILS. W. Va. Dept. Nat. Resources, Bull. no. 5. [viii + 25 p.], illus. 1963. WR 117: 19
With sections on the live-trapping and marking, home range and movement, population estimates, reproduction, sex ratios, age ratios and longevity, mortality, and stocking of the cottontail rabbit. Predator control and habitat development for this species are also considered.

Casteel, David A., and William R. Edwards. SURGICAL ANESTHESIA FOR COTTONTAILS. J. Wildl. Mgmt. 29(1): 196-198, 1 fig. Jan. 1965. WR 117: 19
[Ill. Nat. Hist. Surv., Urbana.] Abstract: Intravenous injection of 30-50 mg/kg body weight of pentobarbital sodium into the medial auricular vein of the ear satisfactorily anesthetized cottontail rabbits (Sylvilagus floridanus) of various ages. Intraperitoneal injections of pentobarbital sodium were not satisfactory for inducing surgical anesthesia. Phencyclidine hydrochloride proved unsatisfactory as an anesthetizing agent, but was used successfully to immobilize cottontail rabbits. Ether was unsatisfactory, probably because adequate apparatus were not available for its efficient use.

French, Norman R., Ray McBride, and Jack Detmer. FERTILITY AND POPULATION DENSITY OF THE BLACK-TAILED JACKRABBIT. J. Wildl. Mgmt. 29(1): 14-26, 3 figs. Jan. 1965. WR 117: 19
[Univ. Calif., Los Angeles.] Abstract: Data on reproduction of the black-tailed jackrabbit (Lepus californicus) in southeastern Idaho, collected by autopsy of specimens from 1955 through 1960, and data on movements and longevity, obtained by marking and releasing live animals, show that, as the population increased, the length of the breeding season apparently decreased and there was a decline of population reproduction, measured by the average number of embryos per mature female. In a population decline, the opposite occurred. It is concluded that reproduction of the jackrabbit population is controlled in density-dependent fashion through frequency of pregnancy of females and to some extent through litter size. Litter size and frequency of pregnancy seemed to vary independently. Litter size in 1956-60 was maximum in May, and this timing appears to be innate. Frequency of pregnancy among females generally was maximum at least 1 month earlier. During the 1957 and 1960 seasons, when the onset of breeding was delayed, maximum frequency of pregnancy coincided with maximum litter size, resulting in apparent compensation for the late start. Comparison of these results with those from studies of the jackrabbit in California, Kansas, and Arizona indicates a shorter breeding season in regions with more severe winter climate and an inverse correlation between litter size and length of breeding season. Marked hares were seldom retrieved at a distance greater than 0.25 mile from the release point, indicating a home range of less than 40 acres. Dispersal movements to greater distances are estimated to affect approximately 18 percent of the population. The greatest distance moved by an animal was 28 miles in a 17-week period. Seasonal movements involved short distances, but might result in dense local concentrations. In a winter population, approximately two-thirds of a marked cohort disappeared from the population each week. Over a longer period approximately 3.5 percent of a marked cohort remained after 1 year.

Goodwin, D. L., and P. O. Currie. GROWTH AND DEVELOPMENT OF BLACK-TAILED JACK RABBITS. J. Mammal. 46(1): 96-98, 1 fig. Feb. 1965. WR 117: 19
[P.O. Peshawar Univ., West Pakistan, India.] Growth curves are given for ear, body, and foot lengths and body weight of Lepus californicus captured near Snowville, Utah.

Heisinger, J. F. ANALYSIS OF THE REINGESTION RHYTHM IN CONFINED COTTONTAILS. Ecology 46(1 & 2): 197-201, 6 figs. Winter 1965. WR 117: 20
[Univ. Mo., Columbia.] Reingestion in caged cottontails occurs as a well-synchronized diel rhythm coinciding with or following sunrise. A gastrocolic reflex appears to govern the rate of hard pellet defecation, but another answer apparently must be found to explain the cyclic production of soft feces. The transition from soft feces to hard pellets occurs previous to and is independent of the evening feeding activity.--From abstr.

Keith, Lloyd B. DAILY ACTIVITY PATTERN OF SNOWSHOE HARES. J. Mammal. 45 (4): 626-627, 1 fig. Nov. 1964. WR 117: 20
[Univ. Wis., Madison.] Automatic recording devices operated in trails of snowshoe hares (Lepus americanus) indicated that these animals were most active at 11:00 PM. There was a steady increase in activity starting at about 2:00 PM and a steady decline from 11:00 PM to 5:00 AM.

Kowalski, Julius M. BUGS 'N BLOOD 'N RABBIT FEVER. Mo. Conserv. 26(1): 1-3, illus. Jan. 1965. WR 117: 20
A well-documented popular article on tularemia.

Krivosheev, V. G. [SOME DATA ON THE BIOLOGY OF THE HARE LEPUS TOLAI IN THE NORTHERN KYZYL-KUM.] Zool. Zhur. 38(2): 288-290. 1959. [From Biol. Abstr. 45(9), 1964, from Referat. Zhur., Biol., 1960, no. 6637. Transl. of Russian abstr. Original (in Russian) with English summ.] WR 117: 20

Lyne, A. G., G. S. Molyneux, R. Mykytowycz, and P. F. Parakkal. THE DEVELOPMENT, STRUCTURE, AND FUNCTION OF THE SUBMANDIBULAR CUTANEOUS (CHIN) GLANDS IN THE RABBIT. Australian J. Zool. 12(3): 340-348, 6 pls. Dec. 1964. WR 117: 20
[CSIRO, Ian Clunies Ross Animal Res. Lab., Prospect, New South Wales, Australia.]

Myers, K. INFLUENCE OF DENSITY ON FECUNDITY, GROWTH RATES, AND MORTALITY IN THE WILD RABBIT. CSIRO Wildl. Res. 9(2): 134-137. Nov. 1964. WR 117: 20
Div. Wildl. Res., CSIRO, Canberra, Australia.] Summary: In the presence of excess food, rabbits confined in large enclosures with adequate living space continue to breed, even at population densities higher than those existing in nature (200 rabbits per acre). High density per se does not seriously affect growth rates of young, or body weights of adult rabbits. There appears to be no increase in mortality directly attributable to physiological upsets.

Myers, K., and E. C. Schneider. OBSERVATIONS ON REPRODUCTION, MORTALITY, AND BEHAVIOUR IN A SMALL, FREE-LIVING POPULATION OF WILD RABBITS. CSIRO Wildl. Res. 9(2): 138-143, 1 fig. Nov. 1964. WR 117: 20
[Div. Wildl. Res., CSIRO, Canberra, Australia.] Summary: The history is described of a small, natural population of rabbits, Oryctolagus cuniculus (L.), during a single breeding season. Each warren colony consisted of a single breeding group, with dominant male and female, a territory around the warren, and one or more unattached rabbits living outside the warren. Predators killed approximately 70% of all young.

Raczyński, Jan. STUDIES ON THE EUROPEAN HARE. V. REPRODUCTION. Acta Theriologica 9(19): 305-352, 10 figs. 30 Dec. 1964. In English with Polish summ. WR 117: 20
[Polish Acad. Sci., Mammals Res. Inst., Białowieża, Poland.] Sexually active males were observed during Dec.-Sept. Pregnant females were found during the period Jan.-Sept. Gonads of males attained their largest sizes in Mar. and of females in Apr., presumably indicating the times of maximum sexual activity. Regression of the male gonads and cessation of spermatogenesis occurred in Sept. Pregnant females were present several weeks after cessation of spermatogenesis. Males were sexually mature at 5-7 months and females at 7-8 months of age. The number of implanted embryos was 1-1.5 per female in Jan. and Feb. and 4.0 in

Apr. Embryonic mortality was highest early in the season. The mean number of litters per female each year was 3.4. The average size of litters was 2.3 young and the annual increase 7-8 young per female. The ratio of males to females was 1:0.93 among embryos and 1:0.95 among animals collected by shooting.--From results.

Stodart, E., and K. Myers. A COMPARISON OF BEHAVIOUR, REPRODUCTION, AND MORTALITY OF WILD AND DOMESTIC RABBITS IN CONFINED POPULATIONS. CSIRO Wildl. Res. 9(2): 144-159, 7 figs. Nov. 1964. WR 117: 21

[Div. Wildl. Res., CSIRO, Canberra, Australia.] Pen-reared rabbits (Oryctolagus cuniculus) remained above ground during the day; wild-reared animals went into ground burrows during the day. Pen-reared rabbits were thus more susceptible to predation than those wild-reared. Rabbits born and reared in pens reproduced successfully, but those reared in small cages and released into larger pens died from disease, injuries, or predation and did not reproduce.

Yuill, Thomas M., and Robert P. Hanson. COLIFORM ENTERITIS OF COTTONTAIL RABBITS. J. Bacteriol. 89(1): 1-8, 5 figs. Jan. 1965. WR 117: 21

[Univ. Wis., Madison.] It was possible to induce mortality of adult rabbits by holding them at -20 C for 2 to 14 days. The animals that died during exposure to low temperatures had signs of enteritis and high numbers of Escherichia coli throughout the intestinal tract. It was possible to prolong the life of cottontails held at -20 C by antibiotic suppression of their intestinal E. coli.--From abstr.

RODENTS--MISCELLANEOUS

Aumann, Glenn David. POPULATION RESPONSES OF MICROTUS PENNSYLVANICUS TO ENVIRONMENTAL SODIUM LEVELS. Ph.D. thesis, Univ. Wis. 154 p. 1964. [From abstr. in Dissertation Abstr. 25(6), 1964.] WR 117: 21

With restricted access to salt in nature population increases are checked at a relatively low level by social stress, while with unrestricted access to salt in nature the suppressive effects of crowding are alleviated, allowing the population to increase to higher levels. Implied in these deductions is the principle that sodium is the critical limiting factor for population increase in many areas.

Bates, J. F. THE CANE-FIELD RAT IN BRITISH GUIANA AND ITS CONTROL. In: Proceedings of the Eleventh Congress of the International Society of Sugar Cane Technologists. 1962. Elsevier Publishing Company (Amsterdam). p. 695-704. 1963. [From Biol. Abstr. 45(10), 1964.] WR 117: 21

[Bookers Sugar Estates, Ltd., Georgetown, British Guiana.]

Bogorodskii, Yu. V. [SOME OBSERVATIONS ON THE BIOLOGY OF APODEMUS SPECIOSUS.] Dokl. Irkutsk. Protivochumnogo Inst. 4: 141-145. 1962. [From Biol. Abstr. 45 (9), 1964, from Referat. Zhur., Biol., 1963, no. 20I267. Transl. of Russian abstr.] WR 117: 21

Buchalczyk, Tadeusz. DAILY ACTIVITY RHYTHM IN RODENTS UNDER NATURAL CONDITIONS. Acta Theriologica 9(20): 357-362, 3 figs. 30 Dec. 1964. In English. WR 117: 21

[Polish Acad. Sci., Mammals Res. Inst., Białowieża, Poland.] The results obtained show that the rhythm of 24-hour activity of Apodemus flavicollis is monophase and nocturnal, whereas that of Clethrionomys glareolus is, as a rule, polyphase and extended over day and night.

Calaby, J. H., and D. J. Wimbush. OBSERVATIONS ON THE BROAD-TOOTHED RAT, MASTACOMYS FUSCUS THOMAS. CSIRO Wildl. Res. 9(2): 123-133, 1 fig. + 2 pls. Nov. 1964. WR 117: 22

[Div. Wildl. Res., CSIRO, Canberra, Australia.] The vole-like broad-toothed rat is now restricted to relict colonies. The few published distribution records, descriptions of habitat, and reports of some new observations on the biology of the species are discussed.

Caldwell, Larry D., and John B. Gentry. INTERACTIONS OF PEROMYSCUS AND MUS IN A ONE-ACRE FIELD ENCLOSURE. Ecology 46(1&2): 189-192, 3 figs. Winter 1965. WR 117: 22

[Central Mich. Univ., Mt. Pleasant.] Abstract: Peromyscus polionotus (old-field mice) and feral Mus musculus (house mice) have coexisted in a large old-field area at the AEC Savannah River Plant for 12 yr following removal of human habitations and the abandonment of agriculture in the region, but in two replicate experiments a Mus population has failed to survive when the two species were confined to a one-acre enclosure in the field. In the second experiment, as described in this paper, five Mus were introduced into the enclosure in December 1960 and nine Peromyscus in June 1961. Rapid population growth in both species occurred in the fall of 1961 until about 23 of each species were present, a much bigger density than occurred outside the enclosure. A decline in recruitment rate and a continued high disappearance rate in the Mus population resulted in a gradual decline and extinction of this species; whereas the Peromyscus population maintained itself at a level of 20 to 28 individuals. The two species at first occupied separate areas in the enclosure, but common occupancy of feeding areas increased as the density increased. It was concluded that interspecific competition for seeds was important in the outcome of the experiment, and that the migratory behavior of Mus greatly reduces competition with the more sedentary Peromyscus when populations of the two species are not confined to a limited area.

Chipman, Robert K. AGE DETERMINATION OF THE COTTON RAT (SIGMODON HISPIDUS). Tulane Studies in Zool. 12(2): 19-38, 15 figs. 23 Feb. 1965. WR 117: 22

[Univ. Vt., Burlington.] From an examination of the data that have been presented it appears that age determination can be accomplished best for animals up to six months of age by a combination of several characters. These included body length, molting pattern, epiphyseal fusion, skull measurements and dry lens weight.

Church, Ronald L. WATER EXCHANGES OF THE CALIFORNIA VOLE, MICROTUS CALIFORNICUS. Ph.D. thesis, Univ. Calif. 66 p. 1964. [From abstr. in Dissertation Abstr. 25(7), 1965.] WR 117: 22

Caged Microtus californicus did not respond to water deprivation by reducing pulmocutaneous evaporation. This species can tolerate some water deprivation but cannot completely compensate for dietary water insufficiency.

Clough, Garrett C. VIABILITY OF WILD MEADOW VOLES UNDER VARIOUS CONDITIONS OF POPULATION DENSITY, SEASON, AND REPRODUCTIVE ACTIVITY. Ecology 46(1&2): 119-134, 6 figs. Winter 1965. WR 117: 22

[Coop. Wildl. Res. Unit, Cornell Univ., Ithaca, N. Y.] In two experiments covering two to four months, the effect of density on survival time and gland weights was studied by manipulation of vole numbers on an island and in large outdoor pens, to create populations of high and low density. The average survival time in cold water and the gland weights showed no differences related to density.--From abstr.

Gebczynski, Marek. EFFECT OF LIGHT AND TEMPERATURE ON THE 24-HOUR RHYTHM IN PITYMYS SUBTERRANEUS (DE SÉL.-LONG.). Acta Therologica 9(9): 125-137, 3 figs. 30 Nov. 1964. In English with Polish summ. WR 117: 22

[Mammals Res. Inst., Białowieża, Poland.] The extent of daily activity of the subterranean Pitymys subterraneus, and consequently the average daily metabolic rate, was dependent on the joint action of light and temperature, but chiefly on temperature.

Hoffmeister, Donald F. UNUSUAL SEX RATIOS IN WINTER AND SPRING-TAKEN POCKET MICE (PEROGNATHUS) IN THE SOUTHWEST. Southwestern Nat. 9(4): 252-254. 25 Dec. 1964. WR 117: 23

[Univ. Ill., Urbana.] Abstract: Of 225 January-to-May records of Perognathus amplus from the Southwest 97.3 per cent are males. All specimens of apache taken in April, the only month for which we have records, are males. For the remaining species--longimembris, flavus, penicillatus, intermedius--during the first 5 months of January through May, more males than females are taken (59.4, 67.5, 73.7, 71.5 per cent, respectively), but the ratio is less unbalanced than for the species P. amplus and P. apache.

Horner, B. Elizabeth, J. Mary Taylor, and Helen A. Padykula. FOOD HABITS AND GASTRIC MORPHOLOGY OF THE GRASSHOPPER MOUSE. J. Mammal. 45(4): 513-535, 19 figs. Nov. 1964. WR 117: 23

[Smith Coll., Northampton, Mass.]

Hsia, Wu-Ping, and Chung-Lu Sun. [THE RELATIVE FATNESS OF THE RED-BACKED VOLE, CLETHRIONOMYS RUTILUS PALLAS.] Acta Zool. Sinica 15(1): 33-43. 1963. [From Biol. Abstr. 45(9), 1964. In Chinese with English summ.] WR 117: 23

Relative fatness or coefficient of condition has been widely used in fish biology as an index to illustrate the environmental suitability and to examine the effect of improvements of conditions in fish management. The authors have tried to introduce this method to mammalogy, using the red-backed vole, Clethrionomys rutilus, as an example. The relative fatness of each animal was calculated by the following formula:

$$K = \frac{100W}{L^3}$$

where K stands for the relative fatness, W the weight in g, L the length of head and body in cms.

Kostelecka-Myrcha, Alina, and Andrzej Myrcha. RATE OF PASSAGE OF FOODSTUFFS THROUGH THE ALIMENTARY TRACT OF NEOMYS FODIENS (PENNANT, 1771) UNDER LABORATORY CONDITIONS. Acta Theriologica 9(20): 371-373, 1 fig. 30 Dec. 1964. In English. WR 117: 23

[Polish Acad. Sci., Mammals Res. Inst., Bisłowieża, Poland.] Stained feces were excreted within the first hour after ingestion of stained food, and all stained food was excreted within 3-4 hours after ingestion.

Lecyk, Mieczyslaw. THE DEPENDENCE OF BREEDING IN THE FIELD VOLE (MICROTUS ARVALIS PALL.) ON LIGHT INTENSITY AND WAVE-LENGTH. Zool. Polon. 12(3): 255-268. 1962 (1963). [From Biol. Abstr. 45(9), 1964. In English with Polish summ.] WR 117: 23

[Zool. Inst., Wrocław Univ., Wrocław, Poland.]

Maeda, Mitsuru. [FIELD EXPERIMENT ON THE BIOLOGY OF FIELD MICE IN WOODLANDS. 2. NATALITY AND MORTALITY OF THE RED-BACKED VOLE, CLETHRIONOMYS RUFOCANUS BEDFORDIAE (THOMAS).] Bull. Govt. Forest Expt. Sta. 160: 1-18, illus. 1963. In Japanese with English summ.] WR 117: 23

[Govt. Forest Expt. Sta., Tokyo, Japan.]

Maksimov, A. A. [METHODS FOR LOCATING AND CHARTING SITES OF PROPAGATION OUTBREAKS OF ARVICOLA TERRESTRIS, FOR COUNTS OF ITS POPULATION AND FORECASTS.] In: (Problems of zoological studies in Siberia.) Knigoizdat (Gorno-Altaisk). p. 154-157. 1962. [From Biol. Abstr. 45(11), 1964, from Referat. Zhur., Biol., 1963, no. 12I199. Transl. of Russian abstr.] WR 117: 23

Moore, Robert E. OLFACTORY DISCRIMINATION AS AN ISOLATING MECHANISM BETWEEN PEROMYSCUS MANICULATUS AND PEROMYSCUS POLIONOTUS. Am. Midland Nat. 73(1): 85-100, 1 fig. Jan. 1965. WR 117: 24

[Mont. State Coll., Bozeman.] Abstract: Experiments were designed to clarify the role of olfactory stimuli in sexual isolation between the closely related and allopatric mice, Peromyscus maniculatus rufinus and P. polionotus leucocephalus. Experimental animals were tested for responses to odors of the opposite sex of each species. Results with both sexes of P. maniculatus revealed consistent responses oriented to odors of their own species. Reactions of P. polionotus suggested no strongly developed species-oriented responses. Control experiments indicated that the significant differences in preferences of P. maniculatus were due to perception of the differences in odors. P. maniculatus males responded to homospecific estrous odors by increased activity. Considerations of the ecology of both species and the results of the present experiments suggest that, along with other sensory stimuli, olfactory cues may be important in pair formation and timing of sexual activity of the pairs. Individual recognition may also be involved but was not adequately tested. Choice of a mating partner does not reside with either sex alone. The species-oriented behavior of P. maniculatus is suggested to be a result of selection for species discrimination produced by sympatry with other species of Peromyscus. Conversely, the lower level of sexual isolation in P. polionotus leucocephalus may be a result of its geographical isolation.

Morrison, P. R., K. Kerst, C. Reynafarje, and J. Ramos. HEMATOCRIT AND HEMOGLOBIN LEVELS IN SOME PERUVIAN RODENTS FROM HIGH AND LOW ALTITUDE. Intern. J. Biometeorology 7(1): 51-58, illus. 1963. [From Biol. Abstr. 45(9), 1964. In English with German and French summ.] WR 117: 24

[Univ. Alaska, College.]

Murray, Keith F. POPULATION CHANGES DURING THE 1957-1958 VOLE (MICROTUS) OUTBREAK IN CALIFORNIA. Ecology 46(1&2): 163-171, 1 fig. Winter 1965. WR 117: 24

[Calif. State Dept. Health, Berkeley.] The Calif. population of Microtus montanus reached a peak level during 1957-58. Although breeding was resumed and increased food and cover became available, a major population decline started in April 1958. Voles in favorable natural habitats showed less evidence of reaching extreme numbers and declined more slowly than those in cultivated fields. Neither disease nor food shortage was thought to have caused the population decline. "Concepts of reduced viability due to crowding were compatible with observed events."

Myers, Gary T., and Terry A. Vaughan. FOOD HABITS OF THE PLAINS POCKET GOPHER IN EASTERN COLORADO. J. Mammal. 45(4): 588-598, 4 figs. Nov. 1964. WR 117: 24

[Colo. Game & Fish Dept., Montrose.] The plants most commonly eaten by pocket gophers (Geomys bursarius) and the percentages of the yearly diet they comprised were: Stipa comata, 22%; Agropyron smithii, 14%; Bouteloua gracilis, 12% and Opuntia humifusa, 9%. Young animals ate significantly more aboveground vegetation than did adults, and young and adults had different preferences for certain plants.--From abstr.

Myrcha, Andrzej. VARIATIONS IN THE LENGTH AND WEIGHT OF THE ALIMENTARY TRACT OF CLETHRIONOMYS GLARBOLUS (SCHREBER, 1780). Acta Theriologica 9(10): 139-148, 2 figs. 30 Nov. 1964. In English with Polish summ. WR 117: 24

[Mammals Res. Inst., Białowieża, Poland.] The length and weight of the alimentary tract of rodents increased with age; however, the ratio of total length and weight of the alimentary tract to the total body length and weight of the animal decreased with increasing age. The alimentary tract grew at the same rate throughout its length. The length and weight of the intestines increase more among females in the breeding season than among males.

Neuffer, G., H. Steiner, and M. Gaudschau. ÜBER DIE VERÄNDERUNGEN DER WIESENFAUNA DURCH EINE FLÄCHENBEHANDLUNG MIT ENDRIN-ALDRIN ZUR BEKÄMPFUNG DER WUHLAMUS. [ON THE CHANGES OF THE MEADOW FAUNA BY A TREATMENT WITH ENDRIN-ALDRIN FOR CONTROL OF VOLES.] Z. Pflanzenkrankh. 67(11/12): 669-674. 1960. [From Biol. Abstr. 45(10), 1964. In German.] WR 117: 25

Abstract: The influence of endrin-aldrin on the fauna of an orchard meadow was examined during the spring of 1958 in the Stuttgart area. The fauna of the meadow was greatly and permanently reduced by treatment with "Largazid", an endrin-aldrin emulsion.

Olenev, V. G. [SEASONAL WEIGHT VARIATIONS IN THE LIVER OF MICE AND VOLES (IN RELATION TO FORECASTING THEIR ABUNDANCE).] In: (Problems of zoological studies in Siberia.) Knigoizdat (Gorno-Altaisk). p. 180-181. 1962. [From Biol. Abstr. 45(9), 1964, from Referat. Zhur., Biol., 1963, no. 19I168. Transl. of Russian abstr.] WR 117: 25

Polezhaev, V. G., Yu. V. Toshchigin, L. A. Kirin, G. D. Khudadov, V. V. Petrova, E. K. Ratsenis, and L. Ya. Yakobson. [STUDY OF RODENT MIGRATIONS BY MEANS OF TAGGING WITH RADIOACTIVE ISOTOPES.] Trudy Tsentr. Nauchn.-Issled. Dezinfeftsionogo Inst. 15: 295-299. 1962. [From Biol. Abstr. 45(10), 1964, from Referat. Zhur., Biol., 1963, no. 19I161. Transl. of Russian abstr.] WR 117: 25

Polyakov, I. Ya. [BIOLOGICAL BASIS FOR THE CONTROL OF RODENTS.] Trudy Vses. Inst. Zashchity Rast. Ministerstvo Sel'skogo Khozyaistva SSSR (Moscow) 12. 219 p., illus. 1958. Price 8 rubles. [From Biol. Abstr. 45(12), 1964, from Referat. Zhur., Biol., 1960, no. 50904 K. Transl. of Russian abstr.] WR 117: 25

Prakash, Ishwar. ECO-TOXICOLOGY AND CONTROL OF THE INDIAN DESERT GERBILLE, MERIONES HURRIANAE (JERDON). II. BREEDING SEASON, LITTER SIZE, AND POST-NATAL DEVELOPMENT. J. Bombay Nat. Hist. Soc. 61(1): 142-149, 2 figs. + 1 pl. Apr. 1964. WR 117: 25

[Central Arid Zone Res. Inst., Jodhpur, India.] The Indian Desert gerbil breeds throughout the year. Gestation varies from 28 to 30 days. There are 1-9 young per litter. Young are born naked. Their eyes are closed until 15-16 days after birth. Nursing lasts 18-20 days. Both males and females are somewhat cannibalistic during the breeding season, and it is supposed that cannibalistic behavior may be an important factor in regulating population numbers.--From summ.

Robinson, William L., and J. Bruce Falls. A STUDY OF HOMING OF MEADOW MICE. Am. Midland Nat. 73(1): 188-224, 8 figs. Jan. 1965. WR 117: 25

[Northern Mich. Univ., Marquette.] Abstract: In an investigation of the means by which meadow mice find their way home, more than 700 mice were displaced. The percentage of mice homing decreased with increasing displacement distance, but the average time of homing from all distances was similar. Mice released a second time in the same location returned in high proportions independent of displacement distance indicating that mortality was a minor factor in preventing homing. These mice did not substantially improve their speed of homing, suggesting that homing had been as direct after the first displacement as after the second. Mice released at long distances in apparently unfamiliar terrain seemed to make little effort to search for home and remained to be captured repeatedly near the release point. At such distances the pattern of dispersal shown by captures near the release point indicated no orientation toward the homeward direction. Mice retained through the summer in two-acre enclosures demonstrated less homing ability than mice from neighboring populations allowed freedom to wander. These various results are interpreted to support the hypothesis that homing is accomplished through prior knowledge of the terrain and to a minor extent through random wandering.

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Ropartz, P. QUELQUES DONNÉES SUR LE TERRIER DU HAMSTER DORÉ (MESOCRICETUS AURATUS). [SOME DATA ON THE BURROW OF THE GOLDEN HAMSTER (MESOCRICETUS AURATUS).] Vie et Milieu 13(2): 359-368, illus. 1962 (1963). [From Biol. Abstr. 45(10), 1964. In French.] WR 117: 26
[Lab. Ethol. Expt., Bures-sur-Yvette, Seine-et-Oise, France.]

Surdacki, Stanisław. ÜBER DIE NAHRUNG DES HAMSTERS, CRICETUS CRICETUS LINNAEUS, 1758. [ON THE FOOD OF THE HAMSTER, CRICETUS CRICETUS LINNAEUS, 1758.] Acta Theriologica 9(20): 384-386. 30 Dec. 1964. In German. WR 117: 26
[M. Curie-Skłodowska Univ., Lublin, Poland.]

Tanton, M. T. PROBLEMS OF LIVE-TRAPPING AND POPULATION ESTIMATION FOR THE WOOD MOUSE, APODEMUS SYLVATICUS (L.). J. Animal Ecol. 34(1): 1-22,,8 figs. Feb. 1965. WR 117: 26
[Monks Wood Exptl. Sta., Abbots Ripton, Huntingdonshire, England.] Live-trapping of a population of Apodemus sylvaticus (L.) to obtain capture/recapture data for estimating population size has proved unsatisfactory. Low captures were obtained each summer, but from the considerable increase in numbers caught during the autumn it was clear that many animals present during the summer had gone undetected. The chance of capture was not equal throughout the population, attributable partly to the presence of trap-prone and trap-shy animals and partly to the pronounced 'edge effect' on the 5.2 ha area, resulting in the range of many mice overlapping the edge of the trapping area. Other problems encountered during live-trapping are reported. The frequency of capture distribution and estimation of a truncated negative binomial for the data leads to a possible new method for estimating population size over a period, allowing for unequal chance of capture in the population.--From summ.

Thaeler, Charles Schropp, Jr. AN ANALYSIS OF THE DISTRIBUTION OF POCKET GOPHER SPECIES IN NORTHEASTERN CALIFORNIA. Ph.D. thesis, Univ. Calif. 140 p. 1964. [From abstr. in Dissertation Abstr. 25(7), 1965.] WR 117: 26
Five species are considered: Thomomys bottae, T. townsendii, T. monticola, T. mazama, and T. talpoides. "Allopatric distribution of forms appears to be the rule. Sympatry seems to occur only between pairs of morphologically divergent types and at least in some cases appears to be related to the ability to utilize hard and soft soils respectively."

Twigg, G. I. WARBLES ON HOLOCHILUS SCIUREUS FROM THE COAST OF BRITISH GUIANA. J. Mammal. 46(1): 98-100. Feb. 1965. WR 117: 26
[Royal Holloway Coll., Englefield Green, Surrey, England.] Of 1689 Holochilus sciureus examined, 137 were hosts to Cuterebra apicalis larva.

Waters, Joseph H., and Bernard H. Stockley. HIBERNATING MEADOW JUMPING MOUSE ON NANTUCKET ISLAND, MASSACHUSETTS. J. Mammal. 46(1): 67-76, 3 figs. Feb. 1965. WR 117: 26
[Univ. R. I., Kingston.] Behavior of one individual Zapus hudsonius that broke dormancy shortly after discovery is discussed, as well as that of another kept in captivity and in dormancy most of the time for about 5 months. Rectal and skin temperatures were measured in the latter.--From abstr.

Webster, Douglas B. EARS OF DIPODOMYS / ADAPTATIONS ALLOW KANGAROO RAT TO MEET STRESSES OF DESERT LIFE. Nat. Hist. 74(2): 26-33, illus. Feb. 1965. WR 117: 26
[New York Univ., New York City.]

Williams, Roger G., Frank B. Golley, and James L. Carmon. REPRODUCTIVE PERFORMANCE OF A LABORATORY COLONY OF PEROMYSCUS POLIONOTUS. Am. Midland Nat. 73(1): 101-110, 1 fig. Jan. 1965. WR 117: 27

[Univ. Ga., Athens.] Abstract: Reproductive performance of a laboratory colony of old-field mice was compared with wild old-field mice of the AEC Savannah River Plant, Aiken, South Carolina. Fertility of males and females declined about 10% in the first generation born and raised in the laboratory as compared to the wild-trapped mice which formed the basis of the colony. Incidence of pregnancy, size of litter, survival of young increased with domestication. Litter size was statistically significantly larger in lactating compared with nonlactating mice and in the first-generation lactating females compared with wild-trapped lactating females.

Zonov, G. B. [THE WINTER DIET OF MICROTUS OECONOMUS.] Dokl. Irkutsk. Protivochumnogo Inst. 4: 137-138. 1962. [From Biol. Abstr. 45(9), 1964, from Referat. Zhur., Biol., 1963, no. 15I310. Transl. of Russian abstr.] WR 117: 27

RATTUS AND MUS

Carrasco Collado, Jorge, and Miguel Abarca Ruano. THE RAT PROBLEM IN THE SUGAR CANE PLANTATIONS OF MEXICO. In: Proceedings of the Eleventh Congress of the International Society of Sugar Cane Technologists. 1962. Elsevier Publishing Company (Amsterdam). p. 705-755, illus. 1963. [From Biol. Abstr. 45(12), 1964.] WR 117: 27

[Inst. Mejoramiento, Azucar, Mexico.]

Jackson, William B. LITTER SIZE IN RELATION TO LATITUDE IN TWO MURID RODENTS. Am. Midland Nat. 73(1): 245-247, 2 figs. Jan. 1965. WR 117: 27

[Bowling Green State Univ., Bowling Green, Ohio.] "Rattus rattus and R. exulans."

Popov, Yu. K. [THE STUDY OF CERTAIN ECOLOGICAL TRAITS OF MURIDAE RODENTS BY MARKING.] Izvest. Kazansk. Fil. Akad. Nauk SSSR, Ser. Biol. Nauk 6: 81-88. 1958. [From Biol. Abstr. 45(12), 1964, from Referat. Zhur., Biol., 1960, no. 61211. Transl. of Russian abstr.] WR 117: 27

SCIURIDS

Balph, David F. ON THE BEHAVIORAL RESPONSES OF FREE UINTA GROUND SQUIRRELS TO TRAPPING. Ph.D. thesis, Utah State Univ. 75 p. 1964. [From abstr. in Dissertation Abstr. 25(8), 1965.] WR 117: 27

The general conclusions were that the behavior and learning characteristics of ground squirrels (Citellus armatus) played an important role in trapping them. Trapping procedures could be developed to take advantage of their behavior in obtaining the type of information desired on the population. Further, many of the responses of ground squirrels to the trap could have been predicted on the basis of what is known about learning in laboratory rats. This suggests that the research of experimental psychologists on laboratory rats may be of practical interest to field biologists dealing with the behavior of wild animals.

Forbes, Richard Bryan. ECOLOGICAL STUDIES OF THE EASTERN AND LEAST CHIPMUNKS. Ph.D. thesis, Univ. Minn. 86 p. 1964. [From abstr. in Dissertation Abstr. 25(8), 1965.] WR 117: 27

Eastern and least chipmunks in the Itasca Park region of Minnesota are found to be ecologically distinct from each other. They differ from each other in: 1) habitat, 2) daily and seasonal activity patterns, 3) time of appearance above ground of young, 4) food habits, 5) gross water requirements, and 6) ability to enter hibernation. A method for determining relative ages of both species is presented. The method is based on tooth eruption.

SCIURIDS--Continued

Keith, James O. THE ABERT SQUIRREL AND ITS DEPENDENCE ON PONDEROSA PINE. Ecology 46(1 & 2): 150-163, 5 figs. Winter 1965. WR 117: 28

[Univ. Calif., Davis.] Abert squirrels (Sciurus aberti) fed chiefly on the inner bark of terminal twigs of Pinus ponderosa during the winter and on the ovulate cones during the summer. Home ranges varied from 5 acres in the winter to 18 acres in the summer. On the average, 3.4 young per litter were born between June 10 and July 12 after a gestation period of about 40 days. Of 729 squirrels, 57% were males and 43% females. Young squirrels had thick ear tufts in Sept., but on adults tufts were absent or very thin at that time. This difference is the best available criterion of age. The number of feeding sites evident after fresh snow was a reliable indicator of squirrel density. Abert squirrels are now less abundant than they were at the turn of the century. This is probably due to deterioration of squirrel habitat caused by logging.--From auth. abstr.

Lozan, N. M. [THE PROBLEM OF THE DISTRIBUTION AND ECOLOGY OF THE SCIURIDAE IN MOLDAVIA.] In: (Problems of the ecology and practical importance of birds and mammals in Moldavia.) Shtiintsa (Kishinev). p. 39-48. 1962. [From Biol. Abstr. 45(9), 1964, from Referat. Zhur., Biol., 1963, no. 20I255. Transl. of Russian abstr.] WR 117: 28

Neumann, Richard L., and Tom J. Cade. TORPIDITY IN THE MEXICAN GROUND SQUIRREL CITELLUS MEXICANUS PARVIDENS (MEARNS). Canadian J. Zool. 43(1): 133-140, 4 figs. Jan. 1965. WR 117: 28

[Syracuse Univ., Syracuse, N. Y.] The oxygen consumption of individuals torpid at room temperatures was 0.2 to 0.4 cc/g hr, while at ambient temperatures from 3.8° to 16°C, it was 0.06 to 0.30 cc/g hr. The difference between body temperature and ambient temperature was 1° to 2°C at ambient temperatures from 6° to 22°C; this difference increased below 6° C. Bouts of torpor lasted from 2 to 60 hours.--From abstr.

Pavlov, B. K. [POPULATION DENSITY AS A FUNCTION OF THE AGE STRUCTURE AMONG SQUIRRELS.] In: (Problems of zoological studies in Siberia.) Knigoizdat (Gorno-Altaisk). p. 185-186. 1962. [From Biol. Abstr. 45(9), 1964, from Referat. Zhur., Biol., 1963, no. 18I213. Transl. of Russian abstr.] WR 117: 28

Rongstad, Orrin J. A LIFE HISTORY STUDY OF THIRTEEN-LINED GROUND SQUIRRELS IN SOUTHERN WISCONSIN. J. Mammal. 46(1): 76-87, 2 figs. Feb. 1965. WR 117: 28

[Univ. Wis., Madison.] Conception dates varied within and between years. Males moved greater distances than females. Spring seemed to be the period when longest movements took place. Adults had a 29% annual survival rate, juveniles, only 16%. Females had a higher survival rate than males. High mortality among juveniles mainly occurred prior to hibernation.--From abstr.

Vereshchagin, N. K., V. G. Geptner, and A. S. Stroganova. [THE TIME AND CAUSES OF THE EXTINCTION OF THE CAUCASIAN MARMOT.] Nauchn. Dokl. Vysshei Shkoly. Biol. Nauki 2: 36-38. 1959. [From Biol. Abstr. 45(12), 1964, from Referat. Zhur., Biol., 1960, no. 56077. Transl. of Russian abstr.] WR 117: 28

BEAVER

Arner, Dale H. RESEARCH AND A PRACTICAL APPROACH NEEDED IN MANAGEMENT OF BEAVER AND BEAVER HABITAT IN THE SOUTHEASTERN UNITED STATES. Trans. 29th N. Am. Wildl. Conf. p. 150-158, 2 figs. 1964. WR 117: 28

[Miss. State Univ., State College.] Extensive loss of timberland resources results from flooding of land by beavers. Trapping and dam blasting are currently the chief methods used for alleviation of the damage. Research is needed toward development of better methods of protecting timber resources, to explore possibilities of marketing beaver fur and meat, and to explore the feasibility of leasing and developing beaver dams for waterfowl habitat.--From auth. abstr.

BEAVER--Continued

Bednarik, Karl E. THE BEAVER: AN EMPIRE BUILDER. Ohio Conserv. Bull. 29 (1): 7-9, 26, illus. Jan. 1965. WR 117: 29
[Magee Marsh Wildl. Area, Oak Harbor, Ohio.] This well-written popular article traces the history of the beaver (Castor canadensis) in Ohio from pioneer days to the present. Ohio's first recent open season on beavers was in 1961. Open seasons have been held in 3-9 counties each year since 1961, with 130-226 beavers harvested annually. Ohio trapping seasons are briefly compared with seasons of other states.

LaGaude, Victor. LE CASTOR RHODANIEN ET LES DOLÉANCES DES ARBORICULTEURS. [THE BEAVERS IN THE RHONE REGION AND THE COMPLAINTS OF ARBORICULTURISTS.] Phytoma 132: 30-33, illus. 1961. [From Biol. Abstr. 45(9), 1964. In French.] WR 117: 29
[Controleur Protect. Vegetaux, Nimes, France.]

Williams, Roger M. BEAVER HABITAT AND MANAGEMENT. Idaho Wildl. Rev. 17(4): 3-7, 7 figs. Jan.-Feb. 1965. WR 117: 29
[Idaho Fish & Game Comm., Boise.] Of the 44,000 miles of Idaho streams, 50% is unsuitable because slopes are too steep and 17% because of use by man. Beaver population density has been one colony per 1.3 to 1.7 miles during the past five years, based on surveys made annually of more than 400 miles of Idaho streams.

MUSKRAT AND NUTRIA

Aliev, F. F. DISPERSAL OF NUTRIA IN THE USSR. J. Mammal. 46(1): 101-102. Feb. 1965. WR 117: 29
[Acad. Sci., Azerbaidzhan, SSR.]

FUR ANIMALS, GENERAL

Szynkiewicz, Ewa, and Janusz Gasparski. BLOOD GROUPS IN THE COYPU. I. ATTEMPT TO OBTAIN HETEROIMMUNE SERA. Acta Theriologica 9(12): 165-170. 30 Nov. 1964. In English with Polish summ. WR 117: 29
[Agr. Univ., Brwinów n/Warsaw, Poland.]

Wood, John E., and Eugene P. Odum. A NINE-YEAR HISTORY OF FURBEARER POPULATIONS ON THE ABC SAVANNAH RIVER PLANT AREA. J. Mammal. 45(4): 540-581, 3 figs. Nov. 1964. WR 117: 29
[Univ. Ga., Athens.] Of 533 animals of the six principal species trapped in November censuses, gray foxes comprised 54%, raccoons 21%, bobcats 11%, red foxes 7%, striped skunks 3% and opossums 3%. Following the very high-density level of about 12 animals per 2-mile trapline in 1954, the numbers caught remained remarkably constant at a level of 4 to 5 per trapline for the next 8 years.--From abstr.

BEARS

Berghofer, Louis. PROBLEM BEARS. N. Mex. Wildl. 9(6): 8-9, 20, illus. Nov.-Dec. 1964. WR 117: 29
[N. Mex. Dept. Game & Fish, Santa Fe.] Individual black bears sometimes pose problems by killing livestock and by raiding garbage cans in camp grounds. Bears killing livestock are usually old or crippled animals. Bears raiding garbage cans are usually young animals recently abandoned by their mothers. The livestock-killing bears are usually killed and the garbage-raiders are usually released on other areas. Annually, 5 to 8 complaints are received of bears killing livestock and from 3-12 complaints are received of camp ground raiders.

BEARS--Continued

Craighead, Frank C., Jr., and John J. Craighead. TRACKING GRIZZLY BEARS. BioScience 15(2): 88-92, 2 figs. Feb. 1965. WR 117: 30
[R.F.D. 1, Boiling Springs, Pa.] A report of methods used and preliminary results obtained in telemetric tracking of grizzly bears (Ursus arctos horribilis) in the Yellowstone National Park.

Harington, C. R. POLAR BEARS AND THEIR PRESENT STATUS. Canadian Audubon 26(1): 4-12. Jan.-Feb. 1964. WR 117: 30
A popular account with sections on characteristic features, evolution, historical records, later exploitation, present range, adaptations to environment, seasonal cycle, life span, injuries and mortality, economic value, present status, and future problems of Ursus maritimus.

Kroutil, O. ZE ZIVOTA KARPATSKYCH MEDVEDU. [ON THE LIFE OF THE BEARS FROM THE CARPATHIAN MOUNTAINS.] Ziva 9(1): 24-25. 1961. [From Biol. Abstr. 45(9), 1964. In Czech.] WR 117: 30

Macpherson, A. H. THE BARREN-GROUND GRIZZLY BEAR AND ITS SURVIVAL IN NORTHERN CANADA. Canadian Audubon 27(1): 2-8, illus. Jan.-Feb. 1965. WR 117: 30

Mundy, K. R. D., and D. R. Flook. NOTES ON THE MATING ACTIVITY OF GRIZZLY AND BLACK BEARS. J. Mammal. 45(4): 637-638. Nov. 1964. WR 117: 30
[British Columbia Fish & Game Branch, Prince George, British Columbia, Canada.] Copulation in both species is described.

MUSTELIDS

Bookhout, Theodore A. THE ALLEGHENY SPOTTED SKUNK IN MARYLAND. Chesapeake Sci. 5(4): 213-215, 1 fig. Dec. 1964. WR 117: 30
[Nat. Resources Inst., LaVale, Md.] Abstract: The Allegheny spotted skunk, Spilogale p. putorius, has been observed or captured at four localities in Allegany County, Maryland, and at one locality in Garrett County, Maryland. One observed and eight trapped specimens comprise the known records of the spotted skunk in Maryland.

Chang, M. C. FERTILIZING LIFE OF FERRET SPERM IN THE FEMALE TRACT. J. Exptl. Zool. 158(1): 87-99, 2 pls. Feb. 1965. WR 117: 30
[Boston Univ., Boston, Mass.] "The fertilizing life of ferret sperm in the female tract is no more than 126 hours."

Grakov, N. N. [ON METHODOLOGY OF DETERMINING THE AGE OF PINE MARTEN.] In: (Problems of zoological studies in Siberia.) Knigoizdat (Gorno-Altaisk). p. 55-57. 1962. [From Biol. Abstr. 45(9), 1964, from Referat. Zhur., Biol., 1963, no. 19I165. Transl. of Russian abstr.] WR 117: 30

Gribkov, P. F. [DISPERSION OF THE SEA OTTER ALONG THE COAST OF THE KAMCHATKA PENINSULA.] Voprosy Geografii Kamchatki (Petropavlovsk) 1: 68-71. 1963. [From Biol. Abstr. 45(9), 1964, from Referat. Zhur., Biol., 1963, no. 19I181. Transl. of Russian abstr.] WR 117: 30

Gryaznukhin, A. I. [DATA ON THE FEEDING OF SABLES IN THE SOUTHWESTERN SPURS OF THE VERKHOYANSK RANGE.] Sb. Nauchn.-Tekh. Inform. Vses. Nauchn.-Issled. Inst. Zhivotnogo Syr'ya & Pushniny 5(8): 14-26. 1963. [From Biol. Abstr. 45 (10), 1964, from Referat. Zhur., Biol., 1963, no. 22I215. Transl. of Russian abstr.] WR 117: 30

Irvine, George W., Lester T. Magnus, and Bernard J. Bradle. THE RESTOCKING OF FISHER IN LAKE STATES FORESTS. Trans. 29th N. Am. Wildl. Conf. p. 307-315. 1964. WR 117: 31

[U. S. Forest Serv., Ironwood, Mich.] The details of a cooperative effort to restore the fisher to portions of its former range in Michigan and Wisconsin as an attempt of biological control of porcupines are given. It briefly covers the status of the fisher. The cooperative aspects, live-trapping and other handling techniques are discussed. Between 1956 and 1963, 60 fisher were released on the Nicolet National Forest in Wisconsin and 61 were released on the Ottawa National Forest in Michigan. Observations indicate that these fisher have survived and the majority of them have remained within 30 miles of the release areas. It is probable, although the evidence is circumstantial, that they are reproducing. There has been evidence of predation on porcupines, but no measurement of the effect has been made. It appears that the major threat to the re-establishment of the species is predator trapping.--G. W. Irvine.

Kisekev, V. A. [DATA ON PROPAGATION OF THE TUNGUSKA SABLE.] Trudy Vses. Sel'skokhoz. Inst. Zaochnogo Obrazovaniya 10: 87-91. 1962. [From Biol. Abstr. 45(10), 1964, from Referat. Zhur., Biol., 1963, no. 19I178. Transl. of Russian abstr.] WR 117: 31

Scotter, George W. OCCURRENCE OF A WOLVERINE IN SOUTHWESTERN ALBERTA. J. Mammal. 45(4): 629. Nov. 1964. WR 117: 31

[Canadian Wildl. Serv., Edmonton, Alberta, Canada.] A wolverine (Gulo luscus) was run over by an automobile on a country road in prairie habitat, 35 miles from the nearest mountain range.

Tkachenko, V. I. [MUSTELA ERMINEA IN THE NORTHWEST CAUCASUS.] Trudy Teberdinsk. Gos. Zapovednika 4: 214-218. 1962. [From Biol. Abstr. 45(9), 1964, from Referat. Zhur., Biol., 1963, no. 19I176. Transl. of Russian abstr.] WR 117: 31

Wood, A. J., I. McT. Cowan, and M. J. Daniel. ORGAN WEIGHT -- BODY WEIGHT RELATIONS IN THE FAMILY MUSTELIDAE: THE MINK (MUSTELA VISON). Canadian J. Zool. 43(1): 55-68, 7 figs. Jan. 1965. WR 117: 31

[Univ. British Columbia, Vancouver, British Columbia, Canada.] The lethal agent used for killing the mink is shown to affect the relative weights of the organs studied. The unsuitability of body weight as an independent variable against which to express organ weights is discussed and it is suggested that heart weight may be a more useful base.--From abstr.

DOGS, WOLVES, FOXES

Ables, Ernest D. AN EXCEPTIONAL FOX MOVEMENT. J. Mammal. 46(1): 102. Feb. 1965. WR 117: 31

[Univ. Wis., Madison.] On 20 May 1963, a young marked male red fox (Vulpes vulpes) was shot 245 miles SSE from the site where it was captured on 29 Aug. 1962.

Dement'ev, N. L. [BIOLOGICAL OBSERVATIONS AND MEASURES FOR THE PRESERVATION OF ARCTIC FOXES IN THE ARKHANGEL'SK NORTH.] Okhrana Prirody & Ozelenenie (Moscow) 3: 31-51. 1960. [From Biol. Abstr. 45(11), 1964, from Referat. Zhur., Biol., 1963, no. 8I202. Transl. of Russian abstr.] WR 117: 31

Hardister, John P. DOG: MAN'S BEST FRIEND. Wildl. in N. C. 29(2): 20-21, 31, illus. Feb. 1965. WR 117: 31

[104 Cedar Ave., Kannapolis, N. C.] An estimate was made that more than 1000 deer are annually killed in N. C. by dogs. "In some areas the number of deer killed by dogs may exceed the number taken by hunters."

DOGS, WOLVES, FOXES--Continued

Kühme, Wolfdietrich. COMMUNAL FOOD DISTRIBUTION AND DIVISION OF LABOUR IN AFRICAN HUNTING DOGS. Nature 205(4970): 443-444, 1 fig. 30 Jan. 1965. WR 117: 32

[Max-Planck-Inst., Seewiesen über Starnberg, Germany.] "Lycaon pictus lupinus."

Pulliainen, Erkki. ON THE DISTRIBUTION AND MIGRATIONS OF THE ARCTIC FOX (ALOPEX LAGOPUS L.) IN FINLAND. Aquilo, Ser. Zool. 2: 25-40, 4 figs. 1965. WR 117: 32

[Univ. Helsinki, Helsinki, Finland.] In general the migrations have followed the peak years of the small rodents in Lapland. Arctic fox is among the group of mammals [including the roe deer, marten, bear and wolf] whose males mainly migrate.--From summ.

Sapozhenkov, Yu. F. [THE DISTRIBUTION AND ECOLOGY OF THE WOLF (CANIS LUPUS) IN TURKMENIA.] Sb. Nauchn.-Tekh. Inform. Vses. Nauchn.-Issled. Inst. Zhivotnogo Syr'ya & Pushniny 5(8): 34-38. 1963. [From Biol. Abstr. 45(9), 1964, from Referat. Zhur., Biol., 1963, no. 22I212. Transl. of Russian abstr.] WR 117: 32

Storm, G. L. MOVEMENTS AND ACTIVITIES OF FOXES AS DETERMINED BY RADIO-TRACKING. J. Wildl. Mgmt. 29(1): 1-13, 4 figs. Jan. 1965. WR 117: 32

[Ill. Nat. Hist. Surv., Urbana.] Abstract: In Carroll County, Illinois, the movements of five red foxes (Vulpes fulva) fitted with miniature collar-type transmitters were recorded by using a tracking system described by Cochran and Lord (1963). Four recaptured foxes, two of which had carried transmitters during a 10-month period, showed no evidence of skin chafing caused by transmitters. Adult animals regularly returned to familiar rest areas for daytime resting but seldom reused a particular bedding place. Two adult males were located at night an average distance of about 0.5 mile from daytime rest areas. These estimates are based on the distances between radio fixes representing daytime retreats and individual fixes showing nocturnal movements. The home range of one adult male during a 6.5-month period was 1.9 miles long by 1.4 miles wide. Precise estimates of home-range areas seemed infeasible, but crude acreage estimates for the ranges of two adult foxes averaged 955 acres. Intraspecific activity and availability of food were markedly important environmental factors affecting the movements of foxes.

CATS

Weddle, Ferris. ON THE COUGAR'S SECRETIVE TRAIL... Defenders of Wildl. News 40(1): 20-25, illus. Jan. 1965. WR 117: 32

[Kamiah, Idaho.] A summary of the legal and population status of the cougar (Felis concolor) in various areas throughout North America.

BIG GAME, GENERAL

Anderson, G. D., and L. M. Talbot. SOIL FACTORS AFFECTING THE DISTRIBUTION OF THE GRASSLAND TYPES AND THEIR UTILIZATION BY WILD ANIMALS ON THE SERENGETI PLAINS, TANGANYIKA. J. Ecol. 53(1): 33-56, 2 figs. Mar. 1965. WR 117: 32

[Ministry Agr., Forests & Wildl., Tengeru, Tanzania.] Wind erosion and soil depth, texture and salt concentration, all of which affect moisture availability, largely determine the grassland patterns. Levels of available nitrogen, manganese, and magnesium may play a minor role. Variations in the vegetation pattern within a broad soil/grassland association can be explained either by burning and grazing patterns or more locally on the basis of the catena. It is unlikely that a nutrient factor is causing the seasonal preference of game for the shorter grassland areas, because nutrients are more available in the soils beneath the longer grassland types. Growth stage and palatability of the grasses, when water is available, are considered to be the most important factors, but the degree of soil poachability in the wet seasons also plays a part.--From summ.

Atkinson, I. A. E. SOME METHODS FOR STUDYING THE EFFECTS OF GOATS ON FOREST. New Zealand J. Bot. 1(4): 405-409, illus. 1963. [From Biol. Abstr. 45(11), 1964.] WR 117: 33
[Bot. Div., Dept. Sci. & Indust. Res., Lower Hutt, New Zealand.] Abstract: Four methods of studying both the qualitative and quantitative effects of goats on forest are described and examples given.

Bromlei, G. F. [THE STATE OF POPULATIONS OF WILD CERVUS NIPPON HORTULORUM AND THE GORAL IN THE FAR EAST.] Izvest. Sibirsk. Otd. Akad. Nauk SSSR 2: 128-138. 1959. [From Biol. Abstr. 45(12), 1964, from Referat. Zhur., Biol., 1960, no. 81713. Transl. of Russian abstr.] WR 117: 33

[Chard, J. S. R.] THE ROE DEER. Forestry Comm. Leafl. no. 45. 26 p., 14 figs. 1964. Available from The Secretary, Forestry Comm., 25 Savile Row, London, W.1, England. Price 2 shillings. WR 117: 33
With information on characteristics, behavior and hunting techniques of the European roe deer (Capreolus capreolus), and the preparation of its meat for table use.

Davis, Robert K. THE VALUE OF BIG GAME HUNTING IN A PRIVATE FOREST. Trans. 29th N. Am. Wildl. Conf. p. 393-403, 1 fig. 1964. WR 117: 33
[Resources for the Future, Washington, D. C.]

Dougall, H. W., and D. L. W. Sheldrick. THE CHEMICAL COMPOSITION OF A DAY'S DIET OF AN ELEPHANT. East African Wildl. J. 2: 51-59, 3 figs. Aug. 1964. WR 117: 33
[Natl. Agr. Res. Sta., Kitale, Kenya.]

Evans, H. Frank. AN INVESTIGATION OF WOODLAND CARIBOU IN NORTHWESTERN UNITED STATES. Trans. 29th N. Am. Wildl. Conf. p. 445-453, 3 figs. 1964. WR 117: 33
[North Idaho Junior Coll., Coeur d'Alene.] "The prediction is made that caribou will continue to wander widely in their small bands of a few to a dozen or more animals and will occasionally be reported. If the west side forests of Glacier National Park reach sufficient maturity and are not reburned, a stable population of caribou may become established there. It is further predicted that man will continue to erode caribou numbers as the wandering animals intersect human activities."

Flyger, Vagn, and Norman W. Davis. DISTRIBUTION OF SIKA DEER (CERVUS NIPPON) IN MARYLAND AND VIRGINIA IN 1962. Chesapeake Sci. 5(4): 212-213, 1 fig. Dec. 1964. WR 117: 33
[Nat. Resources Inst. Univ. Md., College Park.] Abstract: Sika deer have spread from the original site of introduction on James Island in Chesapeake Bay and now occupy the western third of Dorchester County, Maryland. In Virginia they remain confined to Assateague Island.

Geist, Valerius. ON THE BEHAVIOUR OF THE NORTH AMERICAN MOOSE (ALCES ALCES ANDERSONI PETERSON 1950) IN BRITISH COLUMBIA. Behaviour 20(3/4): 377-416, illus. 1963. [From Biol. Abstr. 45(9), 1964. In English with German summ.] WR 117: 33
[Univ. British Columbia, Vancouver, British Columbia, Canada.]

Geist, Valerius. ON THE RUTTING BEHAVIOR OF THE MOUNTAIN GOAT. J. Mammal. 45(4): 551-568, 11 figs. Nov. 1964. WR 117: 33
[Univ. British Columbia, Vancouver, British Columbia, Canada.] Abstract: Mountain goats were observed during two rutting seasons. The manifestations of the rut, the agonistic and the courtship behavior are described and interpreted. It is shown that goats have evolved intense threat displays and have reduced fighting to a minimum. Fights are disadvantageous as examinations of wounded males and observations on a wounded male during the rut revealed. Males court females carefully until the agonistic tendencies of the females

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are depressed. The differences in agonistic behavior of the sexes lead to a social structure in which large, adult males are subdominant to females and yearlings. It was found that the courtship behavior is the antithesis of the males' present threat. Marking behavior may function as an olfactory intimidation mechanism. The significance of the goats' coat pattern is discussed.

Greer, Kenneth R., and Robert E. Howe. WINTER WEIGHTS OF NORTHERN YELLOWSTONE ELK, 1961-62. Trans. 29th N. Am. Wildl. Conf. p. 237-248. 1964. WR 117: 34

[Mont. Fish & Game Dept., Bozeman.] In the 1961-62 program of reducing the Yellowstone National Park elk (Cervus canadensis) herd, weights were taken of 271♂♂ and 856♀♀ of 5 age groups. Weights were also obtained of 414 sets of chest viscera and 324 sets of feet. Comparing the carcass weights with weights reported in other studies, the present study suggests that Yellowstone elk are in relatively poor condition.--From abstr. by K. R. Greer.

Harris, John Tom. POPULATION DYNAMICS OF THE WHITE RIVER ELK HERD, COLORADO. Ph.D. thesis, Univ. Mich. 200 p. 1964. [From abstr. in Dissertation Abstr. 25(6), 1964.] WR 117: 34

Classification of 15,871 animals, during the five-year period, showed the pre-season herd to average 50 bulls and 66 calves per 100 cows, and the post-season herd 23 bulls and 95 calves per 100 cows. The kill averaged 1,645 annually and was composed of 71.9 percent bulls, 24.7 percent cows and 3.4 percent calves. Population projections from these data ranged from 3,580 in 1957 to 7,781 in 1962 with an overall upward (average) trend, something on the order of 20 percent annually, being indicated. The size, structure and dynamics of this elk population were found to be a function of the type and pattern of exploitation, and the resultant compensatory population mechanisms. Available facts indicated this to be a rapidly increasing elk population which is apparently still below the carrying capacity of its range. It was able to increase in spite of relatively heavy annual harvests (over 30 percent) because of a sex ratio distorted in favor of the reproductive segment, a high level of nutrition, a minimum of natural mortality and a significant number of yearlings breeding.

Julander, Odell, and Duane E. Jeffery. DEER, ELK, AND CATTLE RANGE RELATIONS ON SUMMER RANGE IN UTAH. Trans. 29th N. Am. Wildl. Conf. p. 404-414. 1964. WR 117: 34

[Intermountain Forest & Range Expt. Sta., Provo, Utah.] Mixed shrub and aspen types were among the three most preferred types for deer, elk, and cattle. These are the two highest forage producing types on Willow Creek range. Mixed shrub type was first choice for both deer and elk and second choice for cattle. First choice for cattle was the grass-forb type which was the type least used by deer and one of the types least used by elk. Deer and elk preferred the upper slopes, major ridgetops, and middle slopes, while cattle preferred the lower finger ridges, lower slopes, and middle slopes. Type edge effect appeared to be important for cattle as well as deer and elk. Shrub density affected deer use positively; elk use little or slightly positively; and cattle use negatively. Grass utilization was positively related with cattle use, and browse utilization was positively related with deer and cattle use.--From summ.

Lamprey, H. F. ESTIMATION OF THE LARGE MAMMAL DENSITIES, BIOMASS AND ENERGY EXCHANGE IN THE TARANGIRE GAME RESERVE AND THE MASAI STEPPE IN TANGANYIKA. East African Wildl. J. 2: 1-46, 13 figs. Aug. 1964. WR 117: 34

Estimates were made of big game populations per square mile through the use of transect counts and visibility profiles for the transects. The big game population of the Tarangire Reserve varied from 60 per square mile in the rainy season to 250 per square mile in the dry season. The metabolic energy expenditure rate was estimated to vary from 16,000 to 170,000 calories per hour per square mile, respectively, in the rainy and dry seasons.--From summ.

Loveless, Charles M. SOME RELATIONSHIPS BETWEEN WINTERING MULE DEER AND THE PHYSICAL ENVIRONMENT. Trans. 29th N. Am. Wildl. Conf. p. 415-431, 3 figs. 1964. WR 117: 35

[Denver Wildl. Res. Center, Denver, Colo.] Deer behavior patterns in winter were prominently associated with a complex of interrelated factors, but seldom did the reactions of the animals appear to be induced by independent elements acting alone. Of the physical environmental factors studied, deer response seemed to be most closely correlated with high air temperature and low atmospheric moisture, low air temperature accompanied by high winds or high atmospheric moisture or both, presence or absence of ground-surface snow, and the duration and intensity of direct sunlight. The abundance and availability of preferred browse plants, plus the interspersion of areas where such plants occurred, were also decisive with respect to deer behavior and contributed substantially to the animals' apparent non-random spatial distribution.--From concl.

Melichar, Josef. ZUBŘI A LOSI V BELOVĚŽSKÉM PRALESE. [BOS BONASUS IN THE BELOVEZSKY FOREST.] Živa 10(1): 32-33, illus. 1962. [From Biol. Abstr. 45 (10), 1964. In Polish.] WR 117: 35

Novakowski, N. S. CEMENTAL DEPOSITION AS AN AGE CRITERION IN BISON, AND THE RELATION OF INCISOR WEAR, EYE-LENS WEIGHT, AND DRESSED BISON CARCASS WEIGHT TO AGE. Canadian J. Zool. 43(1): 173-178, 1 fig. Jan. 1965. WR 117: 35

[Canadian Wildl. Serv., Fort Smith, Northwest Territories.] Cemental deposition occurred in the premolars and molars beyond age 4.5 and this deposition appeared in the form of alternating layers of translucent and opaque cementum, each set combined to form one annual band. Incisor wear provided a further check on this technique. Eye-lens weight and dressed carcass weight were not reliable indicators of chronological age, particularly beyond 4.5 years of age when tooth replacement could not be used to define the limits of variability found in eye-lens weights and dressed carcass weights.--From abstr.

Ogren, Herman A. BARBARY SHEEP. N. Mex. Dept. Game & Fish, Bull. no. 13. [ii] + 117 p., illus. 1965. WR 117: 35

[N. Mex. Dept. Game & Fish, Santa Fe.] The chief subjects covered are: ancestry, introduction into the United States, population dynamics, age determination, food, reproduction, parasites, predators, and the evaluation of Barbary sheep as a game animal.

Orr, D. J. C., and S. M. Moore-Gilbert. FIELD IMMOBILIZATION OF YOUNG WILDEBEEST WITH SUCCINYLCHOLINE CHLORIDE. East African Wildl. J. 2: 60-66. Aug. 1964. WR 117: 35

Field experience suggested that not only were young wildebeest capable of surviving greater doses of succinylcholine than adults, but there was an absence of secondary complications. Adult animals suffered from regurgitation of ruminal contents and difficulty with breathing. In the field it proved easier to produce consistent results with young wildebeest, and it is suggested that in testing the possible use of succinylcholine for immobilizing other game animals the effect of the drug on both young and old animals should be compared.--From summ.

Pokrovskii, V. S., and Yu. M. Shchadilov. [EFFECT OF HUMAN ACTIVITY ON CHANGES IN THE RANGE AND POPULATION OF MOOSE.] Okhrana Prirody & Zapovendnoe Delo v SSSR 7: 57-65. 1962. [From Biol. Abstr. 45(10), 1964, from Referat. Zhur., Biol., 1963, no. 151276. Transl. of Russian abstr.] WR 117: 35

Reynolds, Hudson G. ELK AND DEER HABITAT USE OF A PINYON-JUNIPER WOODLAND IN SOUTHERN NEW MEXICO. Trans. 29th N. Am. Wildl. Conf. p. 438-444, 1 fig. 1964. WR 117: 36

[Rocky Mt. Forest & Range Expt. Sta., Tempe, Ariz.] Production of herbaceous vegetation is inversely related to both trees and shrubs. Shrub abundance is the most important vegetation factor associated with pellet groups. Good coordination of livestock range improvement with game habitat preservation might be achieved by: (a) clearing only on slopes of less than 15%; (b) leaving existing cover on northeastern exposures. On areas reserved for game habitat, conditions for elk and deer might be improved by: (a) removing or thinning trees, which overtop shrubs, where they exceed about 150 trees per acre; (b) cutting back sprouting species of shrubs that are so tall as to be inaccessible to elk and deer.--From summ. & concl.

Savinov, E. S. [THE REPRODUCTION AND GROWTH OF THE SIBERIAN IBEX IN THE DZHUNGARIAN ALA TAU OF KAZAKHSTAN.] Trudy Inst. Zool. Akad. Nauk Kazakhsk. SSR 17: 167-182. 1962. [From Biol. Abstr. 45(9), 1964, from Referat. Zhur., Biol., 1963, no. 17I216. Transl. of Russian abstr.] WR 117: 36

Scotter, George Wilby. EFFECTS OF FOREST FIRES ON THE WINTER RANGE OF BARREN-GROUND CARIBOU IN NORTHERN SASKATCHEWAN. Canadian Wildl. Serv., Wildl. Mgmt. Bull., Ser. 1, no. 18. 111 p., 26 figs. + 1 map. 1964. In English with French summ. WR 117: 36

[Canadian Wildl. Serv., Ottawa, Ontario.] There has recently been a marked decline in the northern Canada population of barren-ground caribou (Rangifer tarandus groenlandicus). This study covered only a small area of this animal's range, "but, if the effect of fire on plant productivity, plant succession, and growth rates of 'reindeer lichens' are similar throughout the winter range, then there would be little doubt that forest fires have been one of the principal causes of the decline. Regardless of the reason for the decline, the present winter range, with its vast fire-destroyed areas, will place a restriction on caribou numbers for at least a few decades."

Simpson, C. David. OBSERVATIONS ON COURTSHIP BEHAVIOUR IN WARTHOG PHACOCHOERUS AETHIOPICUS PALLAS. Arnoldia 1(20): 1-4, 5 figs. 26 Oct. 1964. WR 117: 36

[Univ. Coll. Rhodesia & Nyasaland, Salisbury, Rhodesia.]

Smith, Norman S., and H. P. Ledger. A PORTABLE TRIPOD AND WEIGHING ASSEMBLY FOR LARGE ANIMALS. J. Wildl. Mgmt. 29(1): 208-210, 3 figs. Jan. 1965. WR 117: 36

[Wash. State Univ., Pullman.] Abstract: A device for weighing large animals in the field was constructed. It consisted of a portable, easily erected tripod of iron pipe and up to five spring balances capable of weighing 1,200 pounds each.

Talbot, Lee M., and J. S. G. McCulloch. WEIGHT ESTIMATIONS FOR EAST AFRICAN MAMMALS FROM BODY MEASUREMENTS. J. Wildl. Mgmt. 29(1): 84-89, 2 figs. Jan. 1965. WR 117: 36

[Univ. Calif., Berkeley.] Abstract: Records of simultaneous weights and standard measurements of 330 individuals of ten species of East African wild animals were analyzed to obtain simple equations for reliable estimates of liveweight from standard body measurements. For rapid field use the best equations are based on a linear regression between total body weight and heart girth. Accuracy was not significantly improved by correcting for sex, age, and body fill, or by including other measurements. These equations apply to all animals of the appropriate species and provide unbiased estimates of weight accurate in general to within 10 percent. Daily and hourly fluctuations in liveweight are of the same order of magnitude as the residual standard deviation of the equations. Because the equations based on heart girth appear to be independent of variations in stomach contents, they may provide as close an estimate of true mean liveweight as is obtained by the single spot weighing of the animal at the time of collection.

Wilson, P. R., and D. F. G. Orwin. THE SHEEP POPULATION OF CAMPBELL ISLAND. New Zealand J. Sci. 7(3): 460-490, 19 figs. Sept. 1964. WR 117: 37
[DSIR, Wellington, New Zealand.] Domesticated sheep were introduced on Campbell Island in 1895 and were managed for wool production until 1931. A feral population remained after management was discontinued. Since 1941 shooting for meat has taken approximately 50 sheep per year, mostly ewes and immatures. During the period 1916-61 there was an annual 5% decline in the population. The effect of sheep on birds is discussed; sheep farming opened up the lower areas, and the royal albatross (Diomedea epomophora) has expanded its nesting area. Reduction of this area is expected to occur now that the sheep numbers are low.--From summ.

Yazan, Yu. P. [BIOLOGICAL FEATURES AND WAYS TO THE ECONOMICAL ASSIMILATION OF THE POPULATION OF MIGRATORY MOOSE OF THE PECHORA TAIGA.] Trudy Pechoro-Ilychsk. Gos. Zapovednika 9: 114-201, illus. 1961. [From Biol. Abstr. 45(9), 1964, from Referat. Zhur., Biol., 1963, no. 17I211. Transl. of Russian abstr.] WR 117: 37

DEER (Odocoileus)

Crouch, Glenn LeRoy. FORAGE PRODUCTION AND UTILIZATION IN RELATION TO DEER BROWSING OF DOUGLAS-FIR SEEDLINGS IN THE TILLAMOOK BURN, OREGON. Ph.D. thesis, Oreg. State Univ. 176 p. 1964. [From abstr. in Dissertation Abstr. 25(6), 1964.] WR 117: 37
Blackberry leaves were the preferred forage during the winter season. Salal ranked high but was limited in distribution. Huckleberry and cascara were preferred woody plants; whereas alder, hazel, and vine maple were utilized only when herbaceous forage was unavailable. Planted Douglas fir occupied a prominent place on the food preference list, ranking higher than most common woody plants. Winter-active herbaceous forage was highly important in winter and early spring diets. Forage preference appeared to be positively related to nutrient content in a majority of the plants which were compared. Notable exceptions were alder in the winter season and huckleberry during most of the year.

Ditchfield, J., J. G. Debbie, and L. H. Karstad. THE VIRUS OF EPIZOOTIC HEMORRHAGIC DISEASE OF DEER. Trans. 29th N. Am. Wildl. Conf. p. 196-201, 2 figs. 1964. WR 117: 37
[Univ. Toronto, Toronto, Ontario, Canada.] The Alberta strain of EHD virus has been shown to contain RNA, to be chloroform resistant, acid sensitive, and to have a particle size of 25-30 mμ with simple cubic symmetry. Because of these properties it is more closely related to the Picornavirus group, particularly the encephalomyocarditis viruses, rather than to the Arboviruses. Investigations into the epizootiology of the disease may well prove profitable if attention is paid to this classification and studies directed along these lines.--J. Ditchfield.

Gillelan, G. Howard. DEER MIRRORS: 9 STATES TEST THEM TO CUT ROAD KILL. Outdoor Life 135(2): 24-26, 143, illus. Feb. 1965. WR 117: 37
A popular story which is essentially a progress report on the use of roadside mirrors for reducing automobile-deer accidents. "Only time and further testing will show the most practical method, but the mirrors have made an impressive showing. Already, it's a safe assumption that the mirrors have saved hundreds of deer. Moreover, injuries to motorists have been reduced and thousands of dollars worth of auto repairs have been saved. It's possible that various types of terrain will call for different treatments. In any event, highway safety engineers as well as game managers will face the deer-auto problem for a long time to come."

Hesselton, William T. WINTER DEER FEEDING -- GOOD OR BAD? [N. Y.] Conservationist 19(3): 8-9, illus. Dec.-Jan. 1964-1965. WR 117: 38
[N. Y. Conserv. Dept., Albany.] Winter starvation of deer in the Adirondack Mountains was negligible or absent except in areas where feeding programs were in effect.

Hiehle, Jack, and Rey Stendell. DEER IN DITCHES. Outdoor Calif. 26(2): 14-15, illus. Feb. 1965. WR 117: 38
"There are two methods to reduce or eliminate deer losses in canals. The first is the complete exclusion of animals from access to water while still providing ways for them to get across. The second method is providing means for the animals to get out once they get into the water."

James, George A., Frank M. Johnson, and Frank B. Barick. RELATIONS BETWEEN HUNTER ACCESS AND DEER KILL IN NORTH CAROLINA. Trans. 29th N. Am. Wildl. Conf. p. 454-463. 1964. WR 117: 38
[SE Forest Expt. Sta., Asheville, N. C.] Hunter access and deer kill on a piedmont area (Uwharrie Wildlife Management Area) and 13 western N. C. wildlife areas ("mountain"). Hunters killed deer closer to access on the piedmont than on the mountain areas. Roads and trails served about equally in distributing successful hunting pressure and since trail construction is cheaper, more trails may be the answer to distributing hunters.

Klebenow, Donald A. A MONTANE FOREST WINTER DEER HABITAT IN WESTERN MONTANA. J. Wildl. Mgmt. 29(1): 27-33, 1 fig. Jan. 1965. WR 117: 38
[Idaho Coop. Wildl. Res. Unit, Moscow.] Abstract: A study of a mule deer (Odocoileus hemionus) winter range was conducted on an area in western Montana, which had been burned in 1919 and where a shrub vegetation type developed. Estimates of present tree densities and of tree densities prior to the fire indicate that about as many trees are present now as in 1919, but the present stands are younger. Browse sampling reveals that four shrubs provide the major amount of browse; one of the most common shrubs, ninebark (Physocarpus malvaceus), is not used. Utilization data show that forage plants on the portions of the winter range with the greatest density of trees are less utilized by the mule deer than those on the more open portions of the range. A continued increase in the size and density of the tree vegetation is expected, with a resultant decrease of forage plants and amount of usable winter range.

Knowlton, Frederick F., and Edwin D. Michael. PLACENTAL INGESTION AND POSSIBLE PARTURANT MORTALITY IN WILD WHITE-TAILED DEER. J. Mammal. 46(1): 107. Feb. 1965. WR 117: 38
[Bur. Sport Fisheries & Wildl., San Antonio, Texas.] An adult female white-tailed deer (Odocoileus virginianus) was found dead. Autopsy suggested that parturition had recently occurred. Large pieces of placenta were found in the rumen.

Krefting, Laurits W., chairman., RESEARCH FOR DEER MANAGEMENT IN THE GREAT LAKES REGION. Great Lakes Deer Group. viii + 73 p. Spiral bound, processed. Dec. 1964. WR 117: 38
Prepared by the 13-member Research Program Analysis Committee of the Great Lakes Deer Group (an organization of wildlife management and research specialists from Ontario, Michigan, Wisconsin, and Minnesota). The status and needs of deer research and management for this region are delineated.

McCullough, Dale R. SEX CHARACTERISTICS OF BLACK-TAILED DEER HOOVES. J. Wildl. Mgmt. 29(1): 210-212, 2 figs. Jan. 1965. WR 117: 38
[Univ. Calif., Berkeley.] Abstract: Measurements of hooves of 106 freshly killed black-tailed deer (Odocoileus hemionus) indicated that sexual differences exist in hooves, and hence tracks. Total length and arc width (width across the toe on an arc described at one-third of the total length from the tip) were measured to the nearest 0.5 millimeter. Deer were aged by tooth replacement and wear. No significant differences existed between sexes in

fawns, but arc width differences in yearlings were significant at the 5 percent level. In adults both length and arc width differences between the sexes were significant at the 5 percent level, with ranges for arc width hardly overlapping. Thus tracks of most adult males, as well as the larger yearling males, can be told with a high degree of certainty. The results have not been extended to other Odocoileus species or subspecies.

McMahan, Craig A., and Charles W. Ramsey. RESPONSE OF DEER AND LIVESTOCK TO CONTROLLED GRAZING IN CENTRAL TEXAS. J. Range Mgmt. 18(1): 1-7, 2 figs. Jan. 1965. WR 117: 39

Highlight: White-tailed deer welfare and production under various intensities of continuous-use grazing by combined cattle, sheep, and angora goats was studied in the Edwards Plateau region of Texas. Under poor range conditions continuous grazing by combined classes of livestock adversely effected deer production through competition for food. Livestock were more efficient competitors for native forage than deer.

Michael, Edwin D. MOVEMENTS OF WHITE-TAILED DEER ON THE WELDER WILDLIFE REFUGE. J. Wildl. Mgmt. 29(1): 44-52, 4 figs. Jan. 1965. WR 117: 39

[Texas A & M Univ., College Station.] Abstract: Movements of white-tailed deer (Odocoileus virginianus) were studied on the Welder Wildlife Refuge in the Coastal Bend area of Texas from June, 1960, to February, 1962. Deer were captured and marked with collars, ear tags, or both, so individuals could be recognized at a distance. Total calculated areas encompassed by individual does varied from 60 to 340 acres and for bucks from 240 to 880 acres. There was not a consistent variation among individual deer in relation to seasonal movements. The area of birth of fawns did not become the center of their range. Variation of measured size of range was affected by (1) number of observations, (2) distribution and frequency of observer's activities, (3) density of vegetation, (4) visibility of marking device, (5) total number of deer in group, and (6) location of roads. Actual deer movements were affected by streams, bodies of water, and vegetation.

Nettles, Kenneth. MIRRORS TO REDUCE DEER-AUTO COLLISIONS. Outdoor Ind. 8 (8): 20-23, illus. Feb. 1965. WR 117: 39

[R.F.D. 4, Winamac, Ind.] Tests conducted suggest that deer strikes by automobiles may have been reduced through the use of roadside mirrors.

Robinson, R. M., J. W. Thomas, and R. G. Marburger. THE REPRODUCTIVE CYCLE OF MALE WHITE-TAILED DEER IN CENTRAL TEXAS. J. Wildl. Mgmt. 29(1): 53-59, 6 figs. Jan. 1965. WR 117: 39

[Texas A & M Univ., College Station.] Abstract: A study of 50 male Texas white-tailed deer (Odocoileus virginianus) showed the reproductive cycle occurred in three phases: primary development, full production, and rest. This three-phase cycle had not been described previously. Initiation of antler growth was accompanied by partial stimulation of testicular development during the primary development phase. In the full production phase, the seminiferous tubules were stimulated further by some factor, presumably testosterone, which enabled spermatogenesis to proceed to maturity. These changes coincided with the shedding of the velvet from the antlers. Involution of the seminiferous tubules and abscision of the antlers were followed by a short period of testicular rest and were characteristic of the rest, the third phase. Peak spermatic production occurred in the latter half of November and early December.

Schultz, Vincent. COMPARISON OF STRONTIUM-90 LEVELS BETWEEN ANTLER AND MANDIBLE OF WHITE-TAILED DEER. J. Wildl. Mgmt. 29(1): 33-38, 1 fig. Jan. 1965. WR 117: 39

[U. S. Atomic Energy Comm., Washington, D. C.] Abstract: Strontium-90 concentrations of antlers and mandibles (plus teeth) collected from 18 white-tailed deer (Odocoileus virginianus) were compared to evaluate the feasibility of utilizing antlers to establish strontium-90 fallout levels during the

period of antler development. As there was a significant correlation (computed $r = 0.74$; $r_{.01}$ (16 df) = 0.59) between antler and mandible level it was concluded that the strontium-90 content of an antler is influenced by bone level; therefore, not a reliable indicator of amount of radionuclide consumed during the antler growth period. The overall average strontium-90 content of mandibles was not significantly different from that of antlers. Further, differences between mandibles and antlers were independent of age of deer.

Schultz, Vincent, and Vagn Flyger. RELATIONSHIP OF SEX AND AGE TO STRONTIUM-90 ACCUMULATION IN WHITE-TAILED DEER MANDIBLES. J. Wildl. Mgmt. 29 (1): 39-43, 1 fig. Jan. 1965. WR 117: 40

[U. S. Atomic Energy Comm., Washington, D. C.] Abstract: Mandibles (plus teeth) of 68 white-tailed deer (Odocoileus virginianus) of various age-classes were collected in December, 1959, at Aberdeen Proving Ground, Maryland, to study strontium-90 distribution within a deer herd. No statistically significant difference was observed in the mean strontium-90 accumulated by males and females, but there was a significant difference between age-classes. Further, there was no significant age-class-sex interaction, implying that the difference between age-classes was independent of sex. The amount of strontium-90 in the mandible was correlated with year of birth and the annual strontium-90 increment and total strontium-90 in the soil. There were no statistically significant differences between the variances of the age-classes of either sex. Considerable variation in the strontium-90 content of mandibles within age-classes was observed.

Short, Henry L., and Elmer B. Remmenga. USE OF FECAL CELLULOSE TO ESTIMATE PLANT TISSUE EATEN BY DEER. J. Range Mgmt. 18(3): 139-144. Mar. 1965. WR 117: 40

[SE Forest Expt. Sta., Nacogdoches, Texas.] In digestion trials with deer, the cellulose content of forages was inversely related to digestible energy of the ration. Fecal cellulose appeared to be the most reliable marker by which to estimate range forage consumed by deer. Cellulose assay of pellet groups with a knowledge of the deer food habits on a particular range would seem to offer a useful technique in estimating forage utilization by deer.--From summ.

Thomas, Jack Ward, R. M. Robinson, and R. G. Marburger. HYPOGONADISM IN WHITE-TAILED DEER OF THE CENTRAL MINERAL REGION IN TEXAS. Trans. 29th N. Am. Wildl. Conf. p. 225-236, 5 figs. 1964. WR 117: 40

[Box 491, Llano, Texas.] During 1959-1962, hypogonadal males, as characterized by regressed testicles and velvet-covered antlers during the breeding season, made up 2.7-9.4% of the total males harvested. Hypogonadism was associated with granite-derived soils. Doe:fawn ratios from a 7-year period and data from 1,936 female reproductive tracts indicated that the incidence of hypogonadal males had little effect on herd reproduction. No hypogonadism was found in females. Among the 30 velvet-antlered animals taken during Nov.-Jan., there were no gross lesions of systemic change except in the testes. The testes contained involuted tubules, and reaction to involution caused thickening of the basement membranes. Involution was decidedly more pronounced than that occurring during any phase of the normal testicular cycle. Hypogonadism assumed variations in testicular involvement due to physiological compensation by the affected animals. These variations are described. None of the animals were capable of reproduction. Tests for various strains of Brucella, Leptospira, and Anaplasma were consistently negative. Toxic agents were considered a possible cause of the syndrome.--From abstr. by J. W. Thomas.

Tinsley, Russell. BEST DEER HUNTING IN THE U.S.A. Sports Afield 152(4): 60, 146, 148, 150, 152, illus. Oct. 1964. WR 117: 40

On the Edwards Plateau in Texas, the success rate of hunters is 80% or better, and the cost to the hunter is about $125 per deer. "The pay-to-hunt stigma has scared off the nonresident hunters, and a heavy influx of out-of-state hunters is something that is vitally needed to help remove this surplus of deer."

Van Etten, Robert C., D. F. Switzenberg, and Lee Eberhardt. CONTROLLED DEER HUNTING IN A SQUARE-MILE ENCLOSURE. J. Wildl. Mgmt. 29(1): 59-73, 4 figs. Jan. 1965. WR 117: 41

[Bur. Sport Fisheries & Wildl., P. O. Box 936, Trenton, N. J.] Abstract: Seven annual controlled hunts (1954-60) were conducted in a square-mile enclosure in northern Michigan to remove surplus white-tailed deer (Odocoileus virginianus) and to study mechanics of deer hunting. Normal hunting conditions were simulated as closely as possible. Prehunt populations varied from 13 to 39 deer, averaging 26. Six were adult bucks. The first five hunts were in late November and early December under rigorous hunting conditions. The last two hunts were prior to the regular November 15-30 deer season under less rigorous conditions. Hunters saw 0.75 deer per hour or a deer each 1.33 hours in the field. Bucks were most difficult to locate, requiring about 18 hours each. Fawns appeared most vulnerable to hunting and adult bucks least vulnerable. Good weather usually increased hunting success. Organized drives were most effective per unit of effort but failed to produce even a sight record of a buck over the 7-year period. Crippling losses were held to a minimum but, even so, amounted to 10-15 percent of the kill. A kill-effort relationship provided a reasonably satisfactory mathematical representation of the harvest data. From 1952 through 1958, an average of 44 percent of the fall population was removed yearly reducing the herd materially. Limitation to a one-third harvest would have maintained the original herd numbers.

Verme, Louis J. REPRODUCTION STUDIES ON PENNED WHITE-TAILED DEER. J. Wildl. Mgmt. 29(1): 74-79, 1 fig. Jan. 1965. WR 117: 41

[Mich. Dept. Conserv., Shingleton.] Abstract: Breeding experiments on mature white-tailed does (Odocoileus virginianus) indicated that a high level of nutrition which resulted in obesity often disrupted the onset of estrus. A generally inadequate ration caused a late, irregular rutting season and prevented mating of animals in very poor vigor. Fecundity in well-fed deer amounted to 1.74 fawns per doe; of the progeny, 35.6 percent were males. For deer on restricted diets the rate was 0.95 fawn per doe with 68.4 percent males. The mean gestation period was lengthened 4-6 days in mothers that were half-starved during pregnancy. Fetal biomass appeared to exert an appreciable influence in triggering parturition.

Youatt, William G., Louis J. Verme, and Duane E. Ullrey. COMPOSITION OF MILK AND BLOOD IN NURSING WHITE-TAILED DOES AND BLOOD COMPOSITION OF THEIR FAWNS. J. Wildl. Mgmt. 29(1): 79-84, 1 fig. Jan. 1965. WR 117: 41

[Mich. Dept. Conserv., Lansing.] Abstract: The results of a study of two groups of white-tailed deer (Odocoileus virginianus) at the Cusino Wildlife Experiment Station of the Michigan Department of Conservation indicate that acute food shortages during pregnancy do not reduce milk nutritive value and adversely affect newborn fawns. Deer produce milk of uniform quality regardless of dietary differences during pregnancy. Variation in milk composition occurs over the course of normal lactation; high concentrations of constituents result when milking ceases abruptly. The blood composition of nursing does remains relatively stable during the 3-week postpartum period. The newborn fawn's blood changes progressively in cellular content and serum chemistry.

MAMMALS--MARINE

Dearborn, John H. FOOD OF WEDDELL SEALS AT McMURDO SOUND, ANTARCTICA. J. Mammal. 46(1): 37-43. Feb. 1965. WR 117: 41

[Stanford Univ., Stanford, Calif.] Abstract: Stomach contents of 44 Weddell seals taken at McMurdo Sound, Antarctica, were examined. Fishes occurred in 97% of the stomachs that contained any food. Mysids, decapod crustaceans, amphipods and cephalopods were the invertebrate prey taken most frequently. All specimens examined were heavily infested with nematodes and cestodes, a condition related to the predominantly fish diet of this seal.

MAMMALS--MARINE--Continued

Fiscus, Clifford H., and Karl Niggol. OBSERVATIONS OF CETACEANS OFF CALIFORNIA, OREGON, AND WASHINGTON. US F&WS, Spec. Sci. Rept.--Fisheries no. 498. iii + 27 p., 12 figs. Jan. 1965. WR 117: 42
[Bur. Commercial Fisheries, Washington, D. C.] Records are given of 16 spp. of cetaceans observed off the west coast of the United States. Weights, measurements, and stomach analyses are included in the paper.--From abstr.

Hewer, H. R. THE DETERMINATION OF AGE, SEXUAL MATURITY, LONGEVITY AND A LIFE-TABLE IN THE GREY SEAL (HALICHOERUS GRYPUS). Proc. Zool. Soc. London 142(4): 593-624, 13 figs. + 4 pls. June 1964. WR 117: 42
[Imperial Coll., London, England.] Annual rings in the cement on the canine teeth were used effectively to determine the age of gray seals. Females were sexually mature at 5 and males at 6 years of age. Bulls appeared not to hold territories until they were 10 years old. There appeared to be high mortality among territorial bulls, with few bulls living beyond the age of 10 years. Some cows lived to be at least 35 years old.

Kenyon, Karl W. FOOD OF HARBOR SEALS AT AMCHITKA ISLAND, ALASKA. J. Mammal. 46(1): 103-104. Feb. 1965. WR 117: 42
[U. S. Fish & Wildl. Serv., Seattle, Wash.] Examination of 7 stomachs indicated that the chief foods were octopus (Octopus sp.) and Atka mackerel (Pleurogrammus monopterygius), a non-commercial fish.

King, Judith E. GIANT EPIPHYSES IN A ROSS SEAL. Nature 205(4970): 515-516, 1 fig. 30 Jan. 1965. WR 117: 42
[British Museum (Nat. Hist.), Cromwell Rd., London, S.W.7, England.]

Ray, Carleton, and David Lavallee. SELF-CONTAINED DIVING OPERATIONS IN McMURDO SOUND, ANTARCTICA: OBSERVATIONS OF THE SUB-ICE ENVIRONMENT OF THE WEDDELL SEAL, LEPTONYCHOTES WEDDELLI (LESSON). Zoologica 49(3): 121-136, illus. + 3 pls. Fall 1964. WR 117: 42
[N. Y. Zool. Soc., New York.] Chiefly on equipment and methods used to enter the under-ice environment.

Roppel, Alton Y., Ancel M. Johnson, Raymond E. Anas, and Douglas G. Chapman. FUR SEAL INVESTIGATIONS, PRIBILOF ISLANDS, ALASKA, 1964. US F&WS, Spec. Sci. Rept.--Fisheries no. 502. v + 46 p., illus. Jan. 1965. WR 117: 42
[Bur. Commercial Fisheries, Washington, D. C.] A total of 48,980 male seals were killed on the Pribilof Islands in 1964. Of 16,452 female seals killed, 72% were in ages 2-5 and 28% were age 6 and older. Marked to unmarked ratios yielded an estimate of 353,000 pups born on the Pribilof Islands in 1964. Total counts of live pups on some rookeries supported this estimate.--From abstr.

Roppel, Alton Y., Ancel M. Johnson, and Douglas G. Chapman. FUR SEAL INVESTIGATIONS, PRIBILOF ISLANDS, ALASKA, 1963. US F&WS, Spec. Sci. Rept.--Fisheries no. 497. v + 60 p., illus. Jan. 1965. WR 117: 42
[Bur. Commercial Fisheries, Washington, D. C.] In the 1963 harvest of fur seals on the Pribilof islands, 42,386 ♂♂ and 32,952 ♀♀ were taken. An estimated 316,000 pups were born. Estimated numbers of pups born (based on tag recoveries) during 1958 and 1959 were 729,000 and 778,000, respectively. Information is given on the age structure of the male kill, the breeding condition of the females, and on marking studies.

MAMMALS--OTHER GROUPS

Buss, Irven O., and Alfred Wallner. BODY TEMPERATURE OF THE AFRICAN ELEPHANT. J. Mammal. 46(1): 104-107, 2 figs. Feb. 1965. WR 117: 42
[Wash. State Univ., Pullman.]

Conaway, Clinton H., and Carl B. Koford. ESTROUS CYCLES AND MATING BEHAVIOR IN A FREE-RANGING BAND OF RHESUS MONKEYS. J. Mammal. 45(4): 577-588, 2 figs. Nov. 1964. WR 117: 43
[Univ. Mo., Columbia.]

Dunnet, G. M. A FIELD STUDY OF LOCAL POPULATIONS OF THE BRUSH-TAILED POSSUM TRICHOSURUS VULPECULA IN EASTERN AUSTRALIA. Proc. Zool. Soc. London 142(4): 665-695, 17 figs. + 1 pl. June 1964. WR 117: 43
[Univ. Aberdeen, Aberdeen, Scotland.] There was variation in trap response among individuals and in individuals at different times. Adult males were territorial. Females occupied smaller ranges than males. In dense populations the ranges of females overlapped. Breeding occurred in both spring and fall.

Keast, Allen. INTERRELATIONSHIPS OF TWO ZEBRA SPECIES IN AN OVERLAP ZONE. J. Mammal. 46(1): 53-66, 2 figs., 1 pl. Feb. 1965. WR 117: 43
[Queen's Univ., Kingston, Ontario, Canada.]

Mykytowycz, R., and T. Nay. STUDIES OF THE CUTANEOUS GLANDS AND HAIR FOLLICLES OF SOME SPECIES OF MACROPODIDAE. CSIRO Wildl. Res. 9(2): 200-217, 4 figs. + 7 pls. Nov. 1964. WR 117: 43
[Div. Wildl. Res., CSIRO, Canberra, Australia.] Involves histological studies on kangaroos (Megaleia rufa, Macropus canguru, Macropus robustus, and Protemnodon bicolor.

Poole, W. E., and Phyllis E. Pilton. REPRODUCTION IN THE GREY KANGAROO, MACROPUS CANGURU, IN CAPTIVITY. CSIRO Wildl. Res. 9(2): 218-234, 1 fig. + 1 pl. Nov. 1964. WR 117: 43
[Div. Wildl. Res., CSIRO, Canberra, Australia.]

Shield, John. A BREEDING SEASON DIFFERENCE IN TWO POPULATIONS OF THE AUSTRALIAN MACROPOD MARSUPIAL (SETONIX BRACHYURUS). J. Mammal. 45(4): 616-625, 3 figs. Nov. 1964. WR 117: 43
[Univ. Western Australia, Nedlands, Western Australia.]

Simpson, C. David. NOTES ON THE BANDED MONGOOSE, MUNGOS MUNGO (GMELIN). Arnoldia 1(19): 1-8, 5 figs. 26 Oct. 1964. WR 117: 43
[Univ. Coll. Rhodesia & Nyasaland, Salisbury, Rhodesia.] Distribution and habitat; description and measurements; pack size and movement; voice; senses and curiosity; dominance; foraging and feeding; drinking; play, scenting or marking; fight/flight patterns; displacement patterns, courtship and mating; gestation and oestrous cycle; and predation are topics of discussion.

Wilber, Charles G. ELECTROCARDIOGRAM OF THE ARMADILLO. J. Mammal. 45(4): 642. Nov. 1964. WR 117: 43
[Univ. Del., Newark.] The electrocardiogram of the armadillo (Dasypus sp.) resembles that obtained from other mammals having heart rates higher than about 100 beats per minute.

BIRDS--GENERAL

Varner, Don A. HOW TO MAKE A SPARROW-FREE BLUEBIRD BOX ROUTE. Inland Bird Banding News 36(6): 93-95, illus. Nov.-Dec. 1964. WR 117: 43
[Box 382, Morrisonville, Ill.] The problem of house sparrows (Passer domesticus) nesting in bluebird (Sialia sialis) boxes can be solved by making the floor of the boxes no more than 3.5 inches on a side, by mounting the boxes no more than 5 feet from the ground, and by destroying the ♂ in the event that a pair starts to nest in a box.

BIRDS--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION

Baird, James, and Andrew J. Meyerriecks. BIRDS FEEDING ON AN ANT MATING SWARM. Wilson Bull. 77(1): 89-91. Mar. 1965. WR 117: 44
[Mass. Audubon Soc., Lincoln.] Contains observations on 13 spp. of birds feeding on flying ants (Lasius alienus).

Borror, Donald J. SONG VARIATION IN MAINE SONG SPARROWS. Wilson Bull. 77 (1): 5-37, 11 figs. Mar. 1965. WR 117: 44
[Ohio State Univ., Columbus.] Based on audiospectrographic analyses of 7,212 tape-recorded songs of 120 birds. Songs of individual birds varied, with as many as 14 patterns being used by one bird.

Borror, Donald J., and William W. H. Gunn. VARIATION IN WHITE-THROATED SPARROW SONGS. Auk 82(1): 26-47, 1 fig. Jan. 1965. WR 117: 44
[Ohio State Univ., Columbus.] Based on sound spectograph analyses of the songs of 433 birds and field observations of 278, it was concluded that there are relatively few patterns in the song of the white-throated sparrow (Zonotrichia albicollis), and existing variations are generally recognizable in the field.

Brooks, William S. EFFECT OF WEATHER ON AUTUMN SHOREBIRD MIGRATION IN EAST-CENTRAL ILLINOIS. Wilson Bull. 77(1): 45-54, 3 figs. Mar. 1965. WR 117: 44
[Univ. Ill., Urbana.] It was concluded that a clockwise wind shift toward north was the primary stimulus to autumnal migratory movement of shorebirds in this area.--From summ.

Dilger, William C. METHODS AND OBJECTIVES OF ETHOLOGY. The Living Bird / First Annual of the Cornell Laboratory of Ornithology / 1962. p. 83-92, 1 fig., 1 pl. 1962. WR 117: 44
[Cornell Univ., Ithaca, N. Y.] A useful introduction to the modern study of bird behavior, with a brief treatment on the history of ethology. Methods of ethology are stressed.

Dol'nik, V. R. [EXPERIMENTAL STUDY OF HATCHING IN SOME BIRDS.] Ornitologiya (Moscow) 5: 404-409. 1962. [From Biol. Abstr. 45(10), 1964, from Referat. Zhur., Biol., 1963, no. 13I152. Transl. of Russian abstr.] WR 117: 44

Ficken, Millicent S. MOUTH COLOR OF NESTLING PASSERINES AND ITS USE IN TAXONOMY. Wilson Bull. 77(1): 71-75. Mar. 1965. WR 117: 44
[Univ. Md., College Park.]

Ganya, I. M. [DATA ON THE ECOLOGY AND ECONOMIC IMPORTANCE OF BIRDS IN MOLDAVIA. 1. TOMTITS.] Izvest. Moldavsk. Fil. Akad. Nauk SSSR 8(41): 101-119. 1957 (1958). [From Biol. Abstr. 45(10), 1964, from Referat. Zhur., Biol., 1960, no. 86599. Transl. of Russian abstr. Original (in Russian) with Rumanian and German summ.] WR 117: 44

Gifford, Cameron Edward. BIOENERGETICS OF LIPID DEPOSITION IN THE BOBOLINK, DOLICHONYX ORYZIVORUS, A TRANS-EQUATORIAL MIGRANT. Ph.D. thesis, Univ. Ga. 59 p. 1964. [From abstr. in Dissertation Abstr. 25(5), 1964.] WR 117: 44
Increased food intake was the chief means of achieving a positive energy balance in the fall. Short photoperiods stimulated fat deposition; long photoperiods inhibited fat deposition or caused a rapid loss of fat. A direct relationship existed between body lipid levels and the intensity of migratory unrest.

Gladkov, N. A. [FISH-EATING BIRDS.] Okhrana Prirody & Ozelenenie (Moscow) 4: 3-10. 1960. [From Biol. Abstr. 45(11), 1964, from Referat. Zhur., Biol., 1963, no. 4I157. Transl. of Russian abstr.] WR 117: 44

Grimes, L. ANTIPHONAL SINGING IN LANIARIUS BARBARUS AND THE AUDITORY REACTION TIME. Ibis 107(1): 101-104, 1 fig. Jan. 1965. WR 117: 45
[Univ. Ghana, Legon, Ghana.] Sound spectrographs and analyses are given of 13 consecutive duets of a pair of Laniarius barbarus.

Hailman, Jack P. NOTES ON QUANTITATIVE TREATMENTS OF SUBCUTANEOUS LIPID DATA. Bird-Banding 36(1): 14-20. Jan. 1965. WR 117: 45
[Inst. Animal Behavior, 31 Fulton St., Newark, N. J.] Summary: Ranking schemes for subcutaneous lipid deposits on migrating birds demand non-parametric statistical analysis. The appropriate measure of central tendency is the median (not mean), and of variation is the percentile (not the standard deviation). The appropriate test of significance for two sets of independent data is the Mann-Whitney U Test (not Student's "t" test), and for related data is the Wilcoxon Matched-pairs Signed-ranks Test; other nonparametric methods are also appropriate, but not as powerful. Similar treatment of other banding data is discussed.

Hall, George A. FALL MIGRATION ON THE ALLEGHENY FRONT. Redstart 31(2): 30-53, 59-60, 2 figs. Apr. 1964. WR 117: 45
[W. Va. Univ., Morgantown.] A summary of 6 years (1958-1963) of hawk observations and mist-netting activities on a bird migration lane in W. Va. An annotated list of birds observed or banded is included.

Kale, Herbert William, II. BIOENERGETICS OF THE LONG-BILLED MARSH WREN, TELMATODYTES PALUSTRIS GRISEUS, IN A SALT MARSH ECOSYSTEM. Ph.D. thesis, Univ. Ga. 189 p. 1964. [From abstr. in Dissertation Abstr. 25(5), 1964.] WR 117: 45
Average production during the nesting season (140 days) was estimated to be 4 gcal/m^2 day. Mean respiratory energy flow was 242 gcal/m^2 day and comprised most of the energy flow (246 gcal/m^2 day). Mean gross energy intake was 351 gcal/m^2 day (70% assimilation efficiency). Insect and spider populations in wren habitats averaged over 500 individuals/m^2 (range: 50-2000) with considerable clumping of some populations. Dry biomass averaged 300 mgm/m^2 and mean energy content was 1500 gcal/m^2 which was only five times the mean daily energy requirement of the wren population. The amount of food in an average-size stomach (0.150 ml, range: 0.075-0.350 ml) must be replaced about 30 times to provide the daily food requirement for maintenance. The turnover time for a 15 hour summer photoperiod is 30 minutes and for a 10 hour winter photoperiod it is 20 minutes. About 15 minutes are required for a wren to catch 15-20 small insects and spiders found in an average stomach. This leaves about half of its time free for other activities during the breeding season. Adults fed larger insects and spiders to the young than they themselves consumed, thus conserving foraging time.

Kale, Herbert W., II. FOOD OF THE LONG-BILLED MARSH WREN, TELMATODYTES PALUSTRIS GRISEUS, IN THE SALT MARSHES OF SAPELO ISLAND, GEORGIA. Oriole 29 (4): 47-61, 1 fig. Dec. 1964. WR 117: 45
[Encephalitis Res. Center, 4001 Tampa Blvd., Tampa, Fla.] An annotated list of food items found in 195 stomachs during breeding and winter seasons. Percentage of volume and frequency of occurrence for the various food items are graphically shown.

Kaufmann, Gerald W., and Robert Ivins. THE EFFECTS OF A FLOOD ON NESTING IOWA MARSH BIRDS. Iowa Bird Life 45(1): 9-11. Mar. 1965. WR 117: 45
[Loras Coll., Dubuque, Iowa.] Heavy rains occurred on 7-8 June 1963 and flooded a marsh area, destroying all low-lying bird nests. Most of the nests of ground-nesting waterfowl and rails contained eggs nearly ready to hatch; waterfowl and rails did not renest. Most redwinged blackbird (Agelaius phoeniceus) nests contained young which were drowned; many pairs renested. Yellow-headed blackbird (Xanthocephalus xanthocephalus) nests contained young nearly ready to fly and a few survived; no yellow-headed blackbirds renested. All long-billed marsh wren (Telmatodytes palustris) nests were destroyed; renesting occurred in the same area. Because of their habit of late nesting, least bitterns (Ixobrychus exilis) were unaffected by the flood.

Kellogg, Peter Paul. BIRD-SOUND STUDIES AT CORNELL. The Living Bird / First Annual of the Cornell Laboratory of Ornithology / 1962. p. 37-48, illus. 1962. WR 117: 46
[Cornell Univ., Ithaca, N. Y.] The difficulties encountered and the results attained in making more than 17,000 recordings of the sounds produced by 1500 spp. are outlined. The Cornell Lab. has bird sound projects operating in Mexico, Africa, Venezuela, Brazil, Hawaii and the Caribbean.

Kellogg, Peter Paul, and Calvin M. Hutchinson. THE SOLAR ECLIPSE AND BIRD SONG. The Living Bird / Third Annual of the Cornell Laboratory of Ornithology / 1964. p. 185-192, 4 figs. 1964. WR 117: 46
[Cornell Univ., Ithaca, N. Y.]

Krushinskii, L. V. [EXTRAPOLATIONAL REFLEXES IN BIRDS.] Uch. Zap. Mosk. Gos. Univ. 197: 145-159. 1958. [From Biol. Abstr. 45(12), 1964, from Referat. Zhur., Biol., 1959, no. 49425. Transl. of Russian abstr.] WR 117: 46
The propensity for extrapolational reflexes is very poorly developed in doves, better developed in chickens, kites and honey buzzards, and so well developed in corvids that it assumes the presence of intelligent activity.

Parkes, Kenneth C. THE CONTRIBUTION OF MUSEUM COLLECTIONS TO KNOWLEDGE OF THE LIVING BIRD. The Living Bird / Second Annual of the Cornell Laboratory of Ornithology / 1963. p. 121-130, 1 fig., 1 sketch. 1963. WR 117: 46
[Carnegie Museum, Pittsburgh, Pa.]

Patterson, Stephen. NESTING HABITS OF IOWA BIRDS. Iowa Bird Life 45(1): 11-15. Mar. 1965. WR 117: 46
[R.R. # 2, Perry, Iowa.] A summary of observations on nesting sites and success of 101 nests of 15 spp.

Pettingill, Olin Sewall, Jr. ALL-DAY OBSERVATIONS AT A ROBIN'S NEST. The Living Bird / Second Annual of the Cornell Laboratory of Ornithology / 1963. p. 47-55, 2 figs. 1963. WR 117: 46
[Cornell Univ., Ithaca, N. Y.]

Prescott, Kenneth W. ATTEMPTED ROBIN PREDATION BY CROW. Wilson Bull. 77 (1): 86. Mar. 1965. WR 117: 46
[N. J. State Museum, Trenton.]

Reynard, George B. THE CADENCE OF BIRD SONG. The Living Bird / Second Annual of the Cornell Laboratory of Ornithology / 1963. p. 139-148, illus. 1963. WR 117: 46
[Cornell Univ., Ithaca, N. Y.]

Sargent, Theodore D. THE ROLE OF EXPERIENCE IN THE NEST BUILDING OF THE ZEBRA FINCH. Auk 82(1): 48-61, 6 figs. Jan. 1965. WR 117: 46
[Univ. Mass., Amherst.] Birds nesting for the first time tended to select the habitat, but not the substrate, of their rearing experience. The fledgling period was apparently more important than the nestling period for the young birds' acquisition of information about the habitat of the nest.--From summ.

Southern, William E. AVIAN NAVIGATION. BioScience 15(2): 87-88, 1 fig. Feb. 1965. WR 117: 46
[Northern Ill. Univ., DeKalb.] "The maximum accurate tracking distance achieved between target birds and receiving units was about 28 miles. Birds were tracked continuously for distances ranging over 100 miles by means of mobile units.... It is clear that before biotelemetry can be used successfully in an extensive inquiry into the migration patterns of birds considerable time and effort must be spent on further development and elaboration of equipment. But it is likely that suitable equipment will eventually be available."

Sutherland, Charles A. NOTES ON THE BEHAVIOR OF COMMON NIGHTHAWKS IN FLORIDA. The Living Bird / Second Annual of the Cornell Laboratory of Ornithology / 1963. p. 31-39, 1 fig. 1963. WR 117: 47
[Cornell Univ., Ithaca, N. Y.]

Swinebroad, Jeff. THE RADAR VIEW OF BIRD MIGRATION. The Living Bird / Third Annual of the Cornell Laboratory of Ornithology / 1964. p. 65-74, 3 figs. 1964. WR 117: 47
[Douglass Coll., New Brunswick, N. J.]

Uhrenholt, S. Aksel. ERNAERINGEN HOS INVADERENDE LILLE KORSNAEB (LOXIA CURVIROSTRA (L.)). [FEEDING BEHAVIOR OF INVADING CROSSBILLS (LOXIA CURVIROSTRA (L.)).] Dansk Ornithol. Forenings Tidsskr. 57(3): 176-178, illus. 1963. [From Biol. Abstr. 45(9), 1964. In Danish with English summ.] WR 117: 47

Verner, Jared. BREEDING BIOLOGY OF THE LONG-BILLED MARSH WREN. Condor 67 (1): 6-30, 9 figs. Jan.-Feb. 1965. WR 117: 47
[Univ. Calif., Berkeley.] Male long-billed marsh wrens (Telmatodytes palustris) were polygamous and attempted to attract additional mates to nests built throughout the breeding season. Laying occurred in the early morning of successive days. Incubation was only by females. Attentive periods average 8.1 and inattentive periods 7.7 minutes. Length of incubation periods decreased with advance of the season and averaged 15.1 days. Each nestling was fed an average of 3.8 times per hour in the a.m. and 3.9 in the p.m. The number of feedings per hour increased with age of young. Clutch sizes were significantly different in different closely-located areas. The clutch size difference was thought to be related to food availability at the time of egg-laying.

Weeden, Robert B. FURTHER NOTES ON WANDERING TATTLERS IN CENTRAL ALASKA. Condor 67(1): 87-89, 2 figs. Jan.-Feb. 1965. WR 117: 47
[Alaska Dept. Fish & Game, Fairbanks.] Information on breeding habitat, biology, and behavior of Heteroscelus incanum.

Zimmerman, John L. CARCASS ANALYSIS OF WILD AND THERMAL STRESSED DICKCISSELS. Wilson Bull. 77(1): 55-70, 3 figs. Mar. 1965. WR 117: 47
[Kans. State Univ., Manhattan.] Body weights of males were significantly greater than those of females because of higher water and protein content. Lipid and carbohydrate contents were the same in both sexes. Free water content of the birds' bodies was reduced by a night of migration. Lipid levels were reduced by the spring molt but not the fall molt. Birds dying under cold stress had negligible lipid content. Birds dying under heat stress had high lipid but low water content.--From summ.

BIRDS--MANUALS, FAUNAS, COMMUNITIES

Brooke, R. K., and W. Tarboton. BIRDS OF THE WEST SINOIA DISTRICT OF SOUTHERN RHODESIA. South African Avifauna Ser. Percy Fitzpatrick Inst. African Ornithol. no. 23. 28 p. 1964. 40¢. WR 117: 47
An annotated list of birds observed during ten months' residence in the area.

Čmak, Jerzy. CHARAKTERYSTYKA EKOLOGICZNA ZESPOŁÓW PTAKÓW (AVES) W BIOTOPACH CHEŁMOWEJ GÓRY. [ECOLOGICAL CHARACTERISTICS OF BIRD ASSOCIATIONS (AVES) IN THE HABITATS OF CHEŁMOWA GÓRA.] Ann. Univ. Mariae Curie-Sklodowska Sect. C Biol. 17: 259-296, illus. 1962 (1963). [From Biol. Abstr. 45(10), 1964. In Polish with Russian and English summ.] WR 117: 47

Ivanauskas, T. LIETUVOS PAUKŠČIAI. III. [BIRDS OF LITHUANIA. VOL. III.] Lietuvos TSR Mokslu Akad. Zool. & Parazit. Inst., Leidykla (Vilnius). 443 p., 102 figs. + col. pls. Second augmented and corrected edition. 1964. In Lithuanian with summaries in Russian and English. WR 117: 48

See WR 100: 58 for entry of earlier edition of this volume and collective review covering the three volumes of this work. Featured in the 2nd edition of volume III: an appendix with annotated accounts of six additional species and summaries in Russian and English covering all species listed.

Ivanter, E. V. [BIRDS OF THE KIVACH FOREST PRESERVE.] Ornitologiya (Moscow) 5: 68-85. 1962. [From Biol. Abstr. 45(10), 1964, from Referat. Zhur., Biol., 1963, no. 14I197. Transl. of Russian abstr.] WR 117: 48

An average of 486 pairs per km^2 frequent the waters and their shores, 86 pairs frequent the marsh, 290 the fir forests, 398 the larch and mixed forests, 217 the pine forests. The average density of population of the hazel grouse (Tetrastes bonasia) is 6.7 specimens per km^2, of black grouse (Lyrurus tetrix), 2.8 and of capercailzie (Tetrao urogallus), 1.0.

Perkins, J. P. A SHIP'S OFFICER CONTINUES HIS STORY: 17 FLYWAYS OVER THE GREAT LAKES. PART II. Audubon Mag. 67(1): 42-45, illus. Jan.-Feb. 1965. WR 117: 48

[Conneaut, Ohio.] This second installment relates numerous observations of behavior of migrating birds accompanying ships operating on the Great Lakes. The ship's attraction to birds was increased by arranging a small grove of living trees. These trees were placed in bushel baskets which could be conveniently moved into situations suitable for photography.

Strokov, V. V. [THE INSECT-EATING BIRDS OF MOSCOW.] Ornitologiya (Moscow) 4: 305-315. 1962. [From Biol. Abstr. 45(10), 1964, from Referat. Zhur., Biol., 1963, no. 10I183. Transl. of Russian abstr.] WR 117: 48

Taylor, J. S. THE BIRDS OF FORT BEAUFORT AND ADELAIDE, C[APE] P[ROVINCE]. South African Avifauna Ser. Percy Fitzpatrick Inst. African Ornithol. no. 22. 40 p. 1964. 40¢. WR 117: 48

A list of birds with brief annotations on their relative abundance.

Turcek, Frantisek J. VTAKY BOROVYCH LESOV TATRANSKYCH PREDHORI. [BIRDS OF THE PINE FORESTS IN THE TATRA FOOTHILLS.] Biologia (Bratislava) 18(7): 504-514, illus. 1963. [From Biol. Abstr. 45(10), 1964. In Czech with German and Russian summ.] WR 117: 48

Williamson, Francis S. L., Leonard J. Peyton, and Malcom E. Islieb. NEW DISTRIBUTIONAL AND OVERWINTERING RECORDS OF BIRDS FROM SOUTH-CENTRAL ALASKA. Condor 67(1): 73-80. Jan.-Feb. 1965. WR 117: 48

[Johns Hopkins Univ., Baltimore, Md.] With notes on 26 spp., chiefly from the region around Cook Inlet.

BIRDS--POPULATIONS & FLUCTUATIONS

Brereton, John LeGay. THE LIFE CYCLES OF THREE AUSTRALIAN PARROTS: SOME COMPARATIVE AND POPULATION ASPECTS. The Living Bird / Second Annual of the Cornell Laboratory of Ornithology / 1963. p. 21-29. 1963. WR 117: 48

[Univ. New England, Armidale, New South Wales, Australia.] Conclusion: It is conceivable that the reproductive capacity of a species might become so great that it might endanger the survival of the species (Cole, 1954; Brereton, 1962). Examined here is the possibility that the life cycles of the three parrots described include a mechanism for reducing the capacity to increase and for providing an adequate reserve supply of individuals in cases of catastrophe. Attention is also drawn to the species and family specificity and to the variation in the life cycle. It is suggested that further work along this line will throw light on the evolution of social behavior and population regulation.

Davis, John. THE "SINGING MALE" METHOD OF CENSUSING BIRDS: A WARNING. Condor 67(1): 86-87. Jan.-Feb. 1965. WR 117: 49
[Univ. Calif., Carmel Valley.] Significantly more rufous-sided towhees (Pipilo erythrophthalmus) were observed when covering a census route immediately after the start of singing in the morning than during return trips over the same route some 15-20 minutes later.

Evenden, Fred G., A. J. Argante, and L. B. Argante. SOUTHERLY OCCURRENCE OF CLARK'S NUTCRACKER. Wilson Bull. 77(1): 86. Mar. 1965. WR 117: 49
[7805 English Way, Bethesda, Md.] Observations on irruptive movement.

Flint, V. E., and V. G. Krivosheev. [CHANGES IN THE BIRD FAUNA OF THE ISMAIL PARK IN A PERIOD OF TWENTY-FIVE YEARS.] Ornitologiya (Moscow) 5: 300-308. 1962. [From Biol. Abstr. 45(9), 1964, from Referat. Zhur., Biol., 1962, no. 9I136. Transl. of Russian abstr.] WR 117: 49

Prieswijk, J. J., and H. Bresser. BEVOLKINGSDICHTHEID BIJ DE FITIS EN DE STRUCTUUR VAN HET LANDSCHAP. [POPULATION DENSITY OF THE WILLOW WARBLER AND THE STRUCTURE OF THE LANDSCAPE.] Levende Nat. 64(12): 285-288. 1961. [From Biol. Abstr. 45(9), 1964. In Dutch.] WR 117: 49
Correlations of numbers of nesting birds with amount of edge in their habitat.

Hardy, James L., Don R. Roberts, and Richard C. Banks. THE COMPOSITION OF A WINTERING POPULATION OF WHITE-CROWNED SPARROWS IN KERN COUNTY, CALIFORNIA. Condor 67(1): 90-91. Jan.-Feb. 1965. WR 117: 49
[Univ. Calif., Berkeley.] Ratio of first year to adult birds and of males to females were both 1:1.

BIRDS--ECONOMICS, CONTROL, MORTALITY

Gavrilov, E. I. [BIOLOGY OF PASSER HISPANIOLENSIS TEMM, AND CONTROL MEASURES AGAINST THE SPECIES IN KAZAKHSTAN.] Trudy Nauchn.-Issled. Inst. Zashchity Rast. Kazakhsk. SSR 7: 459-528. 1962. [From Biol. Abstr. 45(9), 1964, from Referat. Zhur., Biol., 1963, no. 19I137. Transl. of Russian abstr.] WR 117: 49
Detailed paper with 107 references.

Pokozii, I. T. [EUPROCTIS CHRYSORRHOEA AND ITS DESTRUCTIVENESS IN FOREST BELTS.] Trudy Khar'kovsk. Sel'skokhoz. Inst. 36(73): 116-148. 1962. [From Biol. Abstr. 45(10), 1964, from Referat. Zhur., Biol., 1963, no. 6E265. Transl. of Russian abstr.] WR 117: 49
Birds destroy up to 80% of wintering nests of E. chrysorrhoea in weakly populated foci. Their role is particularly important in older forest belts. Chemical control measures against the pest are helpful during the preceding summer, rather than during a current spring, as such timing facilitates easier destruction of remaining caterpillars by the birds and parasites.

BIRDS--PARASITES AND DISEASES

Benton, Allen H., and Vaughnda Shatrau. THE BIRD FLEAS OF EASTERN NORTH AMERICA. Wilson Bull. 77(1): 76-81. Mar. 1965. WR 117: 49
[State Univ. Coll., Fredonia, N. Y.] Summary: Ten species of bird fleas are known from eastern North America. Each species is discussed, and information is given on the techniques for collecting bird fleas and on facilities for identification of these collections.

BIRDS--PARASITES AND DISEASES--Continued

Scherer, William F. THE IMPORTANCE OF BIRDS IN THE ECOLOGY OF ARTHROPOD-BORNE ANIMAL VIRUSES. The Living Bird / Second Annual of the Cornell Laboratory of Ornithology / 1963. p. 131-137, 3 figs. 1963. WR 117: 50
[Cornell Univ., Med. Coll., New York, N. Y.]

GAME BIRDS--GENERAL

Eley Game Advisory Station. HATCHING GAME BIRDS' EGGS IN INCUBATORS. Eley Game Advisory Sta. (formerly I.C.I. Game Serv.) Booklet 11b. 27 p., illus. Revised Summer 1964. WR 117: 50
[Pordingbridge, Hampshire, England.] Selection and care of eggs, choice of incubator, incubation in still-air machines, incubation in cabinet machines, incubation schedule, candling eggs, care of chicks after hatching, are discussed and addresses of equipment supply houses are listed.

Fleetwood, Raymond J., and Eric G. Bolen. COMPOUND CLUTCH OF THE CHACHALACA. Condor 67(1): 84-85, 1 fig. Jan.-Feb. 1965. WR 117: 50
[U. S. Fish & Wildl. Serv., Alamo, Texas.] A nest contained nine eggs which were arranged into four fairly distinct groups (according to size and shell texture) suggesting that eggs had been laid by four different birds. The eggs were not incubated.

Jackson, A. S. A STUDY OF THE INTRODUCTION, RELEASE, AND SURVIVAL OF CERTAIN EUROPEAN AND ASIATIC GAME BIRDS. Trans. 29th N. Am. Wildl. Conf. p. 259-269. 1964. WR 117: 50
[Parks & Wildl. Dept., Canadian, Texas.] During 1955-1957, releases of 332 Spanish red-legged partridges, 241 seesee partridges, and 999 coturnix quail were made in Cottle and Lipscomb counties in northern Texas. All seesee partridges and coturnix quail disappeared soon after release. Three broods of red-legged partridges were found near one release site, and the birds persisted for several months. All red-legged partridges later disappeared. Unusual weather and predator populations were considered responsible for failure of the red-legged partridge stock, and the test was considered to be inconclusive.

QUAIL

Banks, Richard C., and Lewis Wayne Walker. A HYBRID SCALED X DOUGLAS QUAIL. Wilson Bull. 76(4): 378-380, 1 fig. Dec. 1964. WR 117: 50
[Nat. Hist. Museum, San Diego, Calif.] A cage-bred hybrid between Callipepla squamata and Lophortyx douglasii provides a previously unrecorded example of hybridism in the American Phasianidae.

Bauer, Ott. IMPROVING LAND FOR CALIFORNIA VALLEY QUAIL. Calif. Dept. Fish & Game, Game Mgmt. Leaf1. no. 8. 10 p., 4 figs. [1963.] WR 117: 50
[326 E. Sheldon Ave., Gridley, Calif.] A synoptic account of habitat requirements of the Calif. quail (Lophortyx californicus).

Bentley, O. E. DISBASE PROBLEMS OF GROWING QUAIL IN MISSISSIPPI. Modern Game Breeding 1(1): 28-30, 37. Nov. 1964. WR 117: 50
[Charles Pfizer & Co., Inc., Poultry Diagnostic Lab., Forest, Miss.] Causes and treatments for chief diseases affecting captive quail are discussed.

Lewin, Victor. THE INTRODUCTION AND PRESENT STATUS OF CALIFORNIA QUAIL IN THE OKANAGAN VALLEY OF BRITISH COLUMBIA. Condor 67(1): 61-66, 2 figs. Jan.-Feb. 1965. WR 117: 50
[Univ. Alberta, Edmonton, Canada.] California quail (Lophortyx californicus) were first liberated in the area in 1912. In the summer of 1963, there were approximately 250,000 quail in an area of 390 square miles. The present range is correlated with areas receiving no more than two inches of precipitation in any winter month and annually receiving less than 40 inches of snow.--From summ.

Ripley, Thomas H., and Carroll J. Perkins. ESTIMATING GROUND SUPPLIES OF SEED AVAILABLE TO BOBWHITES. J. Wildl. Mgmt. 29(1): 117-121. Jan. 1965. WR 117: 51

[SE Forest Expt. Sta., Asheville, N. C.] Abstract: This test of the feasibility of sampling the amounts and kinds of ground seed supplies available to bobwhites (Colinus virginianus) was successful. Seed numbers and weights can be accurately estimated for relatively large wild-land areas. The sampling requirements are neither great nor prohibitive and estimates for single areas with an accuracy of 50 percent may be obtained from 12 composite samples consisting of about 10 samples each of soil 3 inches in diameter and 1 inch thick. The methods used were capable of detecting area and time differences with sampling requirements and precision sufficiently favorable to adopt the methods for widespread use in assessing treatment effects in controlled experiments or pilot tests and demonstrations. Although the use of transects in distributing samples did not impair sampling, they did not contribute importantly to measuring the total variation. We found that the major source of variation was between locations of composite samples. Thus, virtually any unbiased method of distributing composite samples over the area should suffice. In the field, it seems that variation over large areas is relatively low, whereas locally it may be quite high.

Robel, Robert J., and Norman A. Slade. THE AVAILABILITY OF SUNFLOWER AND RAGWEED SEEDS DURING FALL AND WINTER. J. Wildl. Mgmt. 29(1): 202-206, 2 figs. Jan. 1965. WR 117: 51

[Kans. State Univ., Manhattan.] Abstract: Studies of the food habits of the bobwhite quail (Colinus virginianus) in Kansas revealed that although western ragweed (Ambrosia psilostachya) and sunflower seeds (Helianthus spp.) constituted a major portion of the fall diet of quail, few such seeds were consumed in winter. Counts of giant ragweed (A. trifida) and common sunflower (H. annuus) seeds conducted during October through January showed that the seeds of both species decreased in abundance as winter progressed. Thus, the marked reduction of sunflower and ragweed seeds in the winter diet of bobwhites probably results from a decrease in availability.

Scott, David F. REFORESTATION AND QUAIL MANAGEMENT AT FORT CAMPBELL, KENTUCKY. Trans. 29th N. Am. Wildl. Conf. p. 281-286, 2 figs. 1964. WR 117: 51

[320 Hillaire Drive, Hopkinsville, Ky.] Quail kill data collected over a ten-year period were used to compare quail hunting success in reforested and non-reforested areas. Effect of mechanical site preparation upon hunting success was also discussed.--From auth. abstr.

PHEASANTS

Allan, Philip F. SWITCHGRASS--TOP QUALITY PHEASANT COVER. Modern Game Breeding 1(3): 35-37, 61, illus. Jan. 1965. WR 117: 51

[SCS, Ithaca, N. Y.] On the use of switchgrass (Panicum virgatum) at shooting preserves.

Dahlgren, Robert B., Curtis M. Twedt, and Carl G. Trautman. LENS WEIGHTS OF RING-NECKED PHEASANTS. J. Wildl. Mgmt. 29(1): 212-214. Jan. 1965. WR 117: 51

[S. Dak. Dept. Game, Fish & Parks, Huron.] Abstract: Differences between lens weights of 275 adult male and 338 juvenile male ring-necked pheasants (Phasianus colchicus) collected in October, and between the adult males and 70 adult females, collected in August and midwinter, were highly significant. Correlations of lens weight and body weight with spur length among adult males and tarsal depth among adult females were also highly significant. Lenses were found to be about 95 percent developed by 7-8 months of age, and there was no evidence of continuation of lens growth after the first year.

Hanson, William R., and Ronald F. Labisky. ASSOCIATION OF PHEASANTS WITH VEGETATIVE TYPES IN EAST-CENTRAL ILLINOIS. Trans. 29th N. Am. Wildl. Conf. p. 295-306. 1964. WR 117: 52

[Calif. State Coll., Los Angeles.] The relative degree of association between pheasants and various vegetative types, in relation to the amount of each type existing on the study area, was investigated during winter, spring, and summer of 1957-59. Some of the most marked associations between pheasants and vegetative types (or plowed land) were: in the case of woody plants, "volunteer" native shrubs and small native trees (versus large trees or hedges of osage orange or multiflora rose); plowed (fallow) land in winter; hay and pasture crops in spring, especially tall or short ones, but not those of medium height; and hay and pasture crops and small grains in summer, especially the hay that had been less affected by mowing or grazing.--W. R. Hanson.

Holcomb, Larry C. AGGRESSIVE BEHAVIOR OF HEN PHEASANT WHILE PROTECTING CHICKS. Wilson Bull. 76(4): 380. Dec. 1964. WR 117: 52

[Univ. Toledo, Toledo, Ohio.]

Korschgen, Leroy J. FOODS AND NUTRITION OF MISSOURI AND MIDWESTERN PHEASANTS. Trans. 29th N. Am. Wildl. Conf. p. 159-181. 1964. WR 117: 52

[Mo. Conserv. Comm., Columbia.] Ring-necked pheasants were dependent on agricultural grains during most of the year. Diets of ♂♂ were on a maintenance level throughout the year; diets of ♀♀ changed abruptly from a maintenance to a production level with approach of the breeding season. Summer diets of juveniles were richer in protein and calcium than summer diets of adults. Calcium intake of ♀♀ reached a peak level of 4.59% of the total diet in May and was 6, 14, and 10 times the intake of ♂♂ in April, May, and June, respectively. The ready availability of calcium in the form of snail shells and limestone grit lend to the conclusion that inadequate calcium does not limit pheasant distribution in Mo.--From auth. abstr.

Linder, Raymond Lewis. REGULATION OF PHEASANT DENSITY THROUGH NEST ABANDONMENT IN SOUTH-CENTRAL NEBRASKA. Ph.D. thesis, Univ. Nebr. 113 p. 1964. [From abstr. in Dissertation Abstr. 25(5), 1964.] WR 117: 52

Five hens were subjected to the sound of chicks and in each case the hen continued to incubate until the eggs hatched. In experiments with sight and sound, seven hens, serving as controls, completed incubation, while of the nine hens subjected to both the sight and sound of chicks, four abandoned their nests. Four nests were destroyed by mammals and one hen completed incubation. In the experiment involving full association with chicks, four hens, serving as controls, completed incubation. However, at the 11 nest sites involving full association with chicks, 9 hens abandoned their nests and two nests were destroyed by mammals. It is concluded that an incubating hen could be induced through the presence of chicks hatched by other hens to change from care-of-the-egg to care-of-the-young phase. Since nesting and rearing occur in the same areas, the probability of association between hens and chicks of other hens would increase as the nesting season progresses and the number of broods increases. If nest failures result from these contacts a threshold might be reached where the number of chicks in a given area would be sufficient to preclude further successful nesting there.

Shlapak, G. [PHEASANTS ON BIRYUCHIY ISLAND.] Okhota & Okhotnich'e Khoz. 3: 13-14. 1959. [From Biol. Abstr. 45(12), 1964, from Referat. Zhur., Biol., 1960, no. 6610. Transl. of Russian abstr.] WR 117: 52

Abbott, Waldo G. BLUE GROUSE PERSISTS ON MOUNT PINOS IN SOUTHERN CALIFORNIA. Condor 67(1): 85-86. Jan.-Feb. 1965. WR 117: 53
[Santa Barbara Museum Nat. Hist., Santa Barbara, Calif.] Hooting of Dendragapus obscurus was heard in an area occupied by the race howardi, formerly suspected of being extinct.

Allin, A. E. FLUCTUATIONS IN THE RUFFED GROUSE POPULATION OF THE THUNDER BAY DISTRICT, ONTARIO. Loon [formerly the Flicker] 36(3): 74-83, 1 fig. Sept. 1964. WR 117: 53
[Ontario Dept. Health, 900 Arthur St., Fort William, Canada.] From 1938 to 1963, we studied the grouse population at the Canadian Lakehead, counting all grouse seen during frequent trips throughout the forested areas during the hunting seasons. Peaks of populations occurred in 1942, 1948 and 1955. Minimum populations occurred in the late thirties, in 1943-44-45, and again in 1961-62-63. Possibly local factors favored relatively high populations from 1949 to 1955 when minimal populations were expected. These cycles have been attributed to winters with little snow, to cold, wet, Mays, or Junes, deforestation, over-shooting, and disease.--From summ.

Boag, David Archibald. A POPULATION STUDY OF THE BLUE GROUSE IN SOUTHWEST ALBERTA. Ph.D. thesis, Wash. State Univ. 137 p. 1964. [From abstr. in Dissertation Abstr. 25(5), 1964.] WR 117: 53
In May and June a population of blue grouse (Dendragapus obscurus) contained 29% adult males, 44% adult females, and 27% subadults of both sexes. The sex ratio of juveniles was 1:1 in Sept. and 2.3 females to 1 male in May and June. The annual mortality rate of females was 25% and of males 46% It was suggested that the territoriality of adult males forced the younger male birds into marginal habitat, thus exposing them to increased mortality that resulted in the differential mortality between the sexes. Juvenile blue grouse formed an estimated 65% of the July-Aug. population. This population steadily declined during the past 7 years.

Boag, David A. INDICATORS OF SEX, AGE, AND BREEDING PHENOLOGY IN BLUE GROUSE. J. Wildl. Mgmt. 29(1): 103-108, 7 figs. Jan. 1965. WR 117: 53
[Univ. Alberta, Edmonton.] Abstract: Three separate populations of blue grouse (Dendragapus obscurus), representing three subspecies, are compared from the standpoint of plumage, weight, and breeding phenology. Apparently the color of postjuvenal cervical feathers can be accurately used in sex determination of birds over 6 weeks of age. Juvenile grouse can be recognized during their first summer on the basis of plumage and smaller size. Subadult (yearling) birds during their second summer possess pointed outer primaries and shorter, narrower rectrices. Adults have rounded outer primaries and longer, broader rectrices. Weight as a criterion for separation of adults and subadults is reviewed and shown to be of limited value. Onset of molt in breeding adult and subadult females can be used as a criterion for estimating breeding phenology in at least one population. The age of juveniles, as reflected by the primary molt, can also be used to postdate the sequence of events during the breeding season.

Curtis, James D., and Frank S. Elder. BLUE GROUSE FEEDING ON PLANTED PONDEROSA PINE. J. Wildl. Mgmt. 29(1): 199-200. Jan. 1965. WR 117: 53
[Intermountain Forest & Range Expt. Sta., Ogden, Utah.] Abstract: Study of 495 ponderosa pine (Pinus ponderosa) seedlings planted on a burned-over area in central Idaho indicates that foraging by blue grouse (Dendragapus obscurus) may have disfigured some seedlings or inhibited their growth, but did not significantly affect their survival.

Bley Game Advisory Station. THE FOODS OF WILD PARTRIDGES / CHICKS AND ADULTS. Bley Game Advisory Sta. (formerly I.C.I. Game Serv.) Booklet 18. 12 p., illus. Revised Spring 1964. WR 117: 53
[Fordingbridge, Hampshire, England.] Based on examination of crop and gizzard contents of birds collected in England and Czechoslovakia.

Gullion, Gordon W. IMPROVEMENTS IN METHODS FOR TRAPPING AND MARKING RUFFED GROUSE. J. Wildl. Mgmt. 29(1): 109-116, 3 figs. Jan. 1965. WR 117: 54
[Univ. Minn., St. Paul.] Abstract: Continued use of lily-pad traps for capturing ruffed grouse (Bonasa umbellus) in a forested area near Cloquet, Minnesota, has shown this technique to be highly effective during all but the mid-May to mid-August period of the year. A funnel made of 1-inch poultry netting proved more efficient than a swinging-wire gate, but also led to increased injury to grouse resulting from trampling by snowshoe hares (Lepus americanus) captured in the same traps. Since 1959, several improvements have been made in mirror traps, including a more efficient triggering mechanism based on a standard mouse snap trap, and to reduce trapped-bird injuries, 0.25-inch hardware cloth, burlap-covered sides with a solid metal gate. Using eight colors of anodized butt-end aluminum bands, more than 4,000 ruffed grouse can be individually marked for subsequent identification in the forest. A punch card system facilitates the identification of color-banded grouse observed in the forest.

Hannan, Herbert H., Bernard Callender, and John D. Woodham. SOME OBSERVATIONS AND BEHAVIOR PATTERNS OF PRAIRIE CHICKENS (TYMPANUCHUS CUPIDO ATTWATERI) IN GALVESTON COUNTY, TEXAS. Southwestern Nat. 9(4): 305-306. 25 Dec. 1964. WR 117: 54
[Southwest Texas State Coll., San Marcos.]

Kuznetsov, A. [THE HIMALAYAN SNOW COCK (TETRAOGALLUS HIMALAYENSIS).] Okhota & Okhotnoe Khoz. 9: 23-24. 1962. [From Biol. Abstr. 45(9), 1964, from Referat. Zhur., Biol., 1963, no. 15I224. Transl. of Russian abstr.] WR 117: 54
Data concerning the distribution, diet, reproduction and behavior are given.

Marshall, William H. RUFFED GROUSE BEHAVIOR. BioScience 15(2): 92-94, 4 figs. Feb. 1965. WR 117: 54
[Univ. Minn., St. Paul.] Radio transmitters were placed on 35 ruffed grouse (Bonasa umbellus) during a five-year period. One hen with a brood was tracked from early June to late Oct., and two members of the brood were tracked into Dec. Maps are given showing movements and home range of one bird. By correlating radio signal variations with behavior, it was possible to determine whether marked birds were resting, walking, running, flying, feeding, or drumming.

Robel, Robert J. QUANTITATIVE INDICES TO ACTIVITY AND TERRITORIALITY OF BOOMING TYMPANUCHUS CUPIDO PINNATUS IN KANSAS. Trans. Kans. Acad. Sci. 67(4): 702-712, 3 figs. 17 Feb. 1965. WR 117: 54
[Kans. State Univ., Manhattan.] Booming activity increased as the photoperiod lengthened and light intensity rose from 0 to 600 foot candles and decreased as light intensity exceeded 600 foot candles. Booming activity was greater when temperatures were below 12-16° C and decreased as temperatures rose above 18-20°C. Peak booming activity occurred during the second week of May. Of 30 copulations observed, 21 were performed by one tagged male. Booming territories of males varied from 23.6 to 106.5 square meters.

Safley, Larry. THE RUFFED GROUSE AND HOW TO HUNT IT. Tenn. Conservationist 31(2): 10-14, illus. Feb. 1965. WR 117: 54
Informative article with sections on the description, range, habitat, sex and age determination and management of the ruffed grouse in Tenn. Wildlife management areas of the state providing grouse hunting are mapped.

Schmidt, Victor. LATE NESTING OF A GRAY PARTRIDGE. Blue Jay 22(4): 149. Dec. 1964. WR 117: 54
[Melville, Saskatchewan, Canada.] A brood of gray partridges (Perdix perdix), about three days old, was found near Melville, Saskatchewan, on 21 Sept. 1962. One of the 8 chicks was collected.

Watson, Adam. A POPULATION STUDY OF PTARMIGAN (LAGOPUS MUTUS) IN SCOTLAND. J. Animal Ecol. 34(1): 135-172, 8 figs. Feb. 1965. WR 117: 55
[Marischal Coll., Aberdeen, Scotland.] During 5 years when winter counts were done, numbers stayed fairly constant from autumn till spring, but decreased suddenly in March or April, following the break-up of flocks and the onset of vigorous territory defense. This decrease varied annually from 18% to 47%, and mainly involved birds without territories. Territory-owners shot during March in one year were replaced in 2 weeks. Predation was the only important form of adult mortality. Mortality did not limit breeding numbers, and adult losses during summer were not important, in spite of constant high numbers of resident predators. Predation on eggs and chicks did not appreciably depress breeding production. Spring numbers of cocks and hens were equal in years of increase, but there were many more cocks than hens during declines. There was some evidence of a fluctuation in numbers about once every decade. Breeding success varied between 0.1 and 2.5 fully grown young to 1 old bird in different years. The main losses occurred in the week after hatching, and were not related to current summer weather or to snow cover in the previous winter. Breeding was good in years of increase and in the first year or two of peak numbers, but was poor in later peak years and in years of population decline. Breeding success one year was related to the number of adults in the next summer. Territory size in different years varied inversely with breeding density. The size of breeding stocks was not related to the snow cover in the previous winter or in spring when the birds took territories and were confined to them for feeding.--From summ.

Williams, H. Warrington, and Allen W. Stokes. FACTORS AFFECTING THE INCIDENCE OF RALLY CALLING IN THE CHUKAR PARTRIDGE. Condor 67(1): 31-43, 6 figs. Jan.-Feb. 1965. WR 116: 55
[Westminster Coll., Fulton, Mo.] Maximum calling activity was at low light intensities early and late in the day. Aggressive encounters between males stimulated calling at any time of day. Dominant males called more often than subordinate males. Calling was inhibited by rainfall and the presence of predators. Wild-living females seldom called when paired. Calling activity was unpredictable, and large samples must be obtained when using rally call as an index of population numbers.

TURKEY

Bailey, R. Wayne. A BRIEF HISTORY: THE WILD TURKEY IN WEST VIRGINIA. PART I: TO THE CIVIL WAR. W. Va. Conserv. 28(11): 16-21, illus. Jan. 1965. WR 117: 55
[413 Ninth St., Marlinton, W. Va.]

Bailey, R. Wayne. A BRIEF HISTORY: THE WILD TURKEY IN WEST VIRGINIA. PART II: FROM THE CIVIL WAR TO PRESENT DAY. W. Va. Conserv. 28(12): 12-19, illus. Feb. 1965. WR 117: 55
[413 Ninth St., Marlinton, W. Va.]

Gooden, Sam. SOME PROBLEMS IN WILD TURKEY MANAGEMENT IN NORTH CAROLINA. PART 1. Wildl. in N. C. 29(3): 4-6, illus. Mar. 1965. WR 117: 55
[201 Oakgrove Dr., Graham, N. C.] Some of the requirements of wild turkey habitat (namely, large areas, readily available drinking water, mast-producing hardwoods, forest clearings, and protection from disturbance) are reviewed in the first part of a projected series on the past, present and future of wild turkey management in N. C.

Thomas, Jack Ward, Calvin Van Hoozer, and Rodney G. Marburger. NOTES ON COLOR ABERRANCIES IN THE RIO GRANDE WILD TURKEY. Wilson Bull. 76(4): 381-382. Dec. 1964. WR 117: 55
[Box 1148, Llano, Texas.] Observations on incidence and survival of wild turkeys (Meleagris gallopavo) with white and smoky gray plumages.

Thomas, Jack Ward, Calvin Van Hoozer, and Rodney G. Marburger. WILD TURKEY BEHAVIOR AFFECTED BY THE PRESENCE OF GOLDEN EAGLES. Wilson Bull. 76(4): 384-385. Dec. 1964. WR 117: 56

[Box 1148, Llano, Texas.] Wild turkeys (Meleagris gallopavo) appeared unusually wary when golden eagles (Aquila chrysaetos) were near and in a year when eagles were more frequently observed.

DOVES AND PIGEONS

Chamberlain, James L. FALL FOODS OF MOURNING DOVES IN CENTRAL VIRGINIA. Wilson Bull. 77(1): 84-86. Mar. 1965. WR 117: 56

[Randolph Macon Woman's Coll., Lynchburg, Va.] A table of fall foods is given, based on examination of 238 crops of mourning doves (Zenaidura macroura) bagged by hunters.

Graue, Louis C. THE EFFECT OF PHASE SHIFTS IN THE DAY-NIGHT CYCLE ON PIGEON HOMING AT DISTANCES OF LESS THAN ONE MILE. Ohio J. Sci. 63(5): 214-217, illus. 1963. [From Biol. Abstr. 45(11), 1964.] WR 117: 56

[Bowling Green State Univ., Bowling Green, Ohio.]

Hock, Ronald J. THE INFLUENCE OF THE NEST-SITE ON INCUBATION IN MOURNING AND RINGED TURTLE DOVES. The Living Bird / Second Annual of the Cornell Laboratory of Ornithology / 1963. p. 41-46, illus. 1963. WR 117: 56

[105 Murray St., Binghamton, N. Y.]

Lehner, Philip N. THE MOURNING DOVE--ITS STATUS IN NEW YORK. [N.Y.] Conservationist 18(6): 6-8, illus. June-July 1964. WR 117: 56

[Cornell Univ., Ithaca, N. Y.] "The 1963-64 maximum dates set by the U. S. Fish and Wildlife Service for dove hunting were September 1 and January 15. In New York State the largest percentage of the dove population has gone south by September 1.... It would be possible to shoot some of the over-wintering doves. However, this would merely provide a few doves for a few hunters at the expense of possibly never building a good wintering population."

Mallet, Claude. LES PIGEONS ET LEURS DÉGÂTS. [PIGEONS AND THEIR DAMAGE.] Phytoma 141(9/10): 17-21, illus. 1962. [From Biol. Abstr. 45(5), 1964. In French.] WR 117: 56

In Great Britain the harm done to cereals, beans, turnips, cabbage, and colza by the wood pigeon exceeds the good done by its destruction of insects and weeds. In Belgium the increasingly important colza crop suffers most in cold winters following acorn crop failure. The only sure means of defense is shooting.--Sister M. Adelaide.

Murton, R. K., A. J. Isaacson, and N. J. Westwood. THE USE OF BAITS TREATED WITH α-CHLORALOSE TO CATCH WOOD-PIGEONS. Ann. Appl. Biol. 52(2): 271-293, illus. 1963. [From Biol. Abstr. 45(10), 1964.] WR 117: 56

[Min. Agr., Fisheries & Food, Worplesdon, Surrey, England.]

Murton, R. K., and Monica Vizoso. DRESSED CEREALS AS A HAZARD TO WOOD-PIGEONS (COLUMBA PALUMBUS). Ann. Appl. Biol. 52(3): 503-517. 1963. [From Biol. Abstr. 45(10), 1964.] WR 117: 56

[Min. Agr., Fisheries & Food, Worplesdon, Surrey, England.]

Murton, R. K., N. J. Westwood, and A. J. Isaacson. A PRELIMINARY INVESTIGATION OF THE FACTORS REGULATING POPULATION SIZE IN THE WOODPIGEON COLUMBA PALUMBUS. Ibis 106(4): 482-507, 6 figs. Oct. 1964. WR 117: 56

[Min. Agr., Fisheries & Food, Worplesdon, Surrey, England.] Woodpigeon numbers increased on average 2.4 times through breeding, then dropped steeply between Sept. and Dec. Adult body weights in Nov. and early Dec. were unaffected by the autumn grain supply, but juvenile weights were lower and higher depending on the amount of grain available. In the absence of grain,

clover (Trifolium repens and T. pratense) was used by the pigeons, and clover thus appeared to be more suitable for adult than juvenile birds. As much as 46% of available clover was eaten by pigeons. Fall mortality of pigeons appeared unrelated to grain supplies, and winter mortality appeared unrelated to clover supplies. Shooting was more efficient at low population densities, but could not provide an effective regulatory mechanism.--From summ.

Schmidt-Koenig, Klaus. SUN COMPASS ORIENTATION OF PIGEONS UPON DISPLACEMENT NORTH OF THE ARCTIC CIRCLE. Biol. Bull. 127(1): 154-158, 1 fig. Aug. 1964. WR 117: 57
[Zool. Inst. Univ., Göttingen, Germany.]

Skutch, Alexander F. LIFE HISTORIES OF CENTRAL AMERICAN PIGEONS. Wilson Bull. 76(3): 211-247. Sept. 1964. WR 117: 57
[San Isidro del General, Costa Rica.] Contains sections on the following species: scaled pigeon (Columba speciosa), short-billed pigeon (C. nigrirostris), pale-vented pigeon (C. cayennensis), red-billed pigeon (C. flavirostris), band-tailed pigeon (C. fasciata), white-winged dove (Zenaida asiatica), Inca dove (Scardafella inca), plain-breasted ground dove (Columbigallina minuta), common ground dove (C. passerina), blue ground-dove (Claravis pretiosa), white-fronted dove (Leptotila verreauxi), gray-chested dove (L. cassinii), rufous-naped gray-chested dove (L. cassinii rufinucha), ruddy quail-dove (Geotrygon montana), buff-fronted quail-dove (G. costaricensis), and mourning dove (Zenaidura macroura).

Van Orden, Chr. ENKELE GEGEVENS OMTRENT DE VLAAMSE GAAI ALS HOUTDUIVEN-REGULATOR. [SOME DATA ON THE REGULATION OF THE NUMBER OF WOOD-PIGEONS BY THE JAY.] Levende Nat. 64(9): 214-215. 1961. [From Biol. Abstr. 45(10), 1964. In Dutch.] WR 117: 57

Wight, Howard M. MATEDNESS IN THE MOURNING DOVE AND ITS EFFECT ON THE NATIONWIDE DOVE-CALL CENSUS. Trans. 29th N. Am. Wildl. Conf. p. 270-281. 1964. WR 117: 57
[Oreg. State Univ., Corvallis.] We conclude therefore, that estimations of matedness ratios, based on the assumption that few adult females will be unmated, derived from sex ratios from banding data or hunter bag samples are biased in favor of males. This bias is inherent in the behavior of the mourning dove. An alternate approach to determining the expected range of matedness ratios in wild dove populations is through adult sex ratios derived from mortality and production data. Adult females usually have higher annual average mortality rates than do males. It has been shown that the displaced sex ratio arising from such a condition can be predicted when a uniform production rate per adult female and a constant immature mortality rate are assumed. Calculations based on preliminary data suggest that the adult sex ratio should stabilize at approximately 110 males per 100 females. At this sex ratio, matedness ratios would be 10 mated males per unmated male. Fluctuations of matedness ratios in this range would have little influence on the census results.--From concl.

WATERFOWL

Anderson, William. WATERFOWL PRODUCTION IN THE VICINITY OF GULL COLONIES. Calif. Fish & Game 51(1): 5-15, 4 figs. Jan. 1965. WR 117: 57
[P. O. Box 284, Gridley, Calif.] Abstract: The effect on waterfowl nesting of the proximity of gull colonies was studied at Hartson Reservoir, Lassen County, California. Data were obtained through field observations and by collecting gull stomachs. There was no evidence that gulls interfered with the production of Canada geese. No significant waterfowl remains were detected in 95 gull stomachs examined. However, some predation on young ducklings by gulls was observed, but overall losses from this source were not considered severe. Habitat could be improved for waterfowl by constructing island nest sites and by establishing shrubby vegetation on the islands.

Bartonek, James C., Joseph J. Hickey, and Lloyd B. Keith. AN EVALUATION OF WATERFOWL REGULATIONS AND LOCAL HARVESTS IN WISCONSIN. Wis. Acad. Sci., Arts & Letters 53: 83-107, 6 figs. 1964. WR 117: 58

A resumé of waterfowl regulations and an evaluation of their influence upon the harvesting of 8,078 ducks, 11 geese, and 1,032 coots on Lake Winnebago, Wis., by A. L. Osborn and his friends during 1907-1939. Diving ducks represented 86% of the bag. Of the 9,121 waterfowl killed 269 (2.9%) were in excess of bag limits and 122 (1.3%) were protected. Regulations did not effectively prohibit or limit the numbers of canvasback, redhead, bufflehead and ruddy duck bagged; but they appeared to be effective in the case of the wood duck.--From summ.

Bellrose, Frank C. RADAR STUDIES OF WATERFOWL MIGRATION. Trans. 29th N. Am. Wildl. Conf. p. 128-143, 5 figs. 1964. WR 117: 58

[Ill. Nat. Hist. Surv., Havana.] The chronology and direction of waterfowl migration differed at four radar stations operated in Mo., Iowa and Ill. during Nov. 1962. The majority of waterfowl migrating at night did not appear to be influenced in their course of flight by major river valleys.--From summ.

Burgess, Harold H., Harold H. Prince, and David L. Trauger. BLUE-WINGED TEAL NESTING SUCCESS AS RELATED TO LAND USE. J. Wildl. Mgmt. 29(1): 89-95. Jan. 1965. WR 117: 58

[Squaw Creek Natl. Wildl. Refuge, Mound City, Mo.] Abstract: Blue-winged teal (Anas discors) nesting success was studied from 1959 to 1961 to determine its relationship to refuge land-use practices at Union Slough National Wildlife Refuge in Iowa. Blue-winged teals comprised from 41 to 69 percent of the total breeding population, and a total of 111 teal nests were located. Kentucky bluegrass (Poa pratensis) and alfalfa (Medicago sativa) were the preferred nesting cover types and supported 77 percent of the teal nests. Grazed grasslands had a nesting density of one nest per 10 acres, and nesting success was 47 percent. Ungrazed land had a nesting density of one nest per 17 acres with a nesting success of 14 percent. Refuge hayfields had a nesting density of one nest per 9 acres and a nesting success of 46 percent. Haying operations were permitted only between July 1 and August 20 to reduce nest losses. Grasslands moderately grazed between June 15 and October 1 provided better nesting habitat for blue-winged teals than did ungrazed areas. Grazed grasslands and hayfields were equally productive nesting habitats for blue-wings.

Buscher, Henry N. ECTOPARASITES FROM ANSERIFORM BIRDS IN MANITOBA. Canadian J. Zool. 43(1): 219-221. Jan. 1965. WR 117: 58

[Univ. Okla., Norman.] Abstract: A total of 107 birds were examined of which 78 were positive and 29 were negative. Eight species of ectoparasites were identified from 11 species of birds. It was not uncommon to find two or more species of ectoparasites on a single host specimen. Most of the ecto-parasites of anseriform birds are not limited in their occurrence to a given species but are found to be well established on several host species.

Gottlieb, Gilbert. COMPONENTS OF RECOGNITION IN DUCKLINGS / AUDITORY CUES HELP DEVELOP FAMILIAL BOND. Nat. Hist. 74(2): 12-19, illus. Feb. 1965. WR 117: 58

[Dorothea Dix Hospital, Raleigh, N. C.] "In summary, the results of our field work suggest that in nature auditory stimulation from the parent is a typical component of the stimulative complex which, at the very least, initiates parental recognition in ground-nesting as well as hole-nesting species of ducklings. Visual recognition factors would seem to come into prominence only after the initial establishment of the parent-young bond on the basis of auditory stimulation and interaction."

Hansen, Henry A., and Donald E. McKnight. EMIGRATION OF DROUGHT-DISPLACED DUCKS TO THE ARCTIC. Trans. 29th N. Am. Wildl. Conf. p. 119-127, 3 figs. 1964. WR 117: 59

[Bur. Sport Fisheries & Wildl., Juneau, Alaska.] "The cumulative aerial survey data show an inverse relationship between duck populations on the southern prairies and in the northern habitat during periods of duress in the former.... As prairie potholes disappear and their associated waterfowl population diminishes, the duck population expands in the north. When the prairie becomes re-watered, it absorbs ducks at the expense of the north. These population shifts move rather consistently in the same direction, but not in the same magnitude, and only for a limited number of years.... The prairie pothole dabbling duck breeding population index dropped from a high of 12.6 million birds in 1956 to 6.5 million in 1959, a loss of 6 million. During the same period, the dabbler index in northern Alberta, NWT and Alaska climbed from 1.6 million to 3.9 million, a gain of only 2.3 million."

Hori, John. METHODS OF DISTINGUISHING FIRST-YEAR AND ADULT SHELDUCKS IN THE FIELD. British Birds 58(1): 14-15, 1 pl.. Jan. 1965. WR 117: 59

Adult and immature shelducks (Tadorna tadorna) can be distinguished in the field by examination of the greater wing coverts. The greater coverts of the adult are white while those of the immature have broad gray coverts.

Kiracofe, Jack M. EXPERIENCES WITH THE PINTAIL DUCK. Modern Game Breeding 1(1): 12-13, 37, illus. Nov. 1964. WR 117: 59

[Boiling Springs, Pa.] With useful information on captive-rearing of pintails.

Leins, G. T. THE METHOD OF RINGING ONE-DAY-OLD DUCKLINGS. The Ring 4(41): 75-76, illus. Nov. 1964. WR 117: 59

"The rings are shaped on a special metal form which exactly corresponds with the diameter of adult duck's tarsus. The inner side of the ring is polstered with a layer of plasteline which, when the tarsus grows, is gradually pressed out.... Up to December 1962, of 57 recovered ringed ducks, 44 legs with rings were retrieved. All the legs were in perfect condition and no damage was noted."

Lensink, Calvin J. DISTRIBUTION OF RECOVERIES FROM BANDINGS OF DUCKLINGS. US F&WS, Spec. Sci. Rept.--Wildl. no. 89. x + 146 p., 19 figs. Dec. 1964. WR 117: 59

Abstract: This report presents the recovery distributions of 10 species of game ducks banded as flightless young on the breeding grounds. Conclusions are based on 20,152 direct or first year band recoveries, 9,272 of which are of mallards. The recovery distributions of these ducks by State and Flyway, or country, of recovery from breeding ground aerial survey strata or State of banding are presented. In addition, mallard recoveries from bandings grouped by geographical region are presented to show distribution variations attributable to region, year of banding, sex, first year versus later years of recovery, weather, etc. Recovery rates of mallards banded as flightless young and the affects of various factors on recovery rates are discussed.

Locke, L. N., J. B. DeWitt, C. M. Menzie, and J. A. Kerwin. A MERGANSER DIE-OFF ASSOCIATED WITH LARVAL EUSTRONGYLIDES. Avian Diseases 8(3): 420-427. Aug. 1964. WR 117: 59

[Patuxent Wildl. Res. Center, Laurel, Md.] Summary: A die-off of red-breasted mergansers on Lake Holly, Virginia Beach, Virginia, was found to be due to a larval Eustrongylides. Massive tissue destruction and hemorrhage was produced by the migration of the larval Eustrongylides. Earlier stages of the same Eustrongylides were found in eastern mosquitofish and silversides upon which the mergansers had been feeding. In addition, residues of DDT were found in mosquitofish, gizzard shad, and five mergansers collected from Lake Holly, and in the tissues of two mergansers from Back Bay, Virginia. However, the information available was insufficient to establish the significance of these residue levels.

Molodovskii, A. V. [MIGRATION OF COMMERCIAL AQUATIC BIRDS ON SOUTHERN MANGISHLAK.] Ornitologiya (Moscow) 5: 345-355. 1962. [From Biol. Abstr. 45 (9), 1964, from Referat. Zhur., Biol., 1962, no. 9I155. Transl. of Russian abstr.] WR 117: 60

Pulliainen, Erkki. ON THE HISTORY, ECOLOGY AND ETHOLOGY OF THE MALLARDS (ANAS PLATYRHYNCHOS L.) OVERWINTERING IN FINLAND. Ornis Fenn. 40(2): 45-66. 1963. [From Biol. Abstr. 45(10), 1964.] WR 117: 60
[Dept. Agr. & Forest Zool., Univ. Helsinki, Helsinki, Finland.]

Schoennagel, Erich. DER ABENDFLUG DER STOCKENTE UND SEINE ABHÄNGIGKEIT VON DER LICHTINTENSITÄT. [THE DEPENDENCE OF THE EVENING FEEDING FLIGHT OF MALLARDS ON LIGHT INTENSITY.] Proc. Intern. Ornithol. Congr. 13: 293-298. 1963. [From Biol. Abstr. 45(9), 1964. In German.] WR 117: 60
[Am Meisenbrink 14, Hameln/Weser, Germany.]

Schorger, A. W. THE TRUMPETER SWAN AS A BREEDING BIRD IN MINNESOTA, WISCONSIN, ILLINOIS, AND INDIANA. Wilson Bull. 76(4): 331-338, 1 fig. Dec. 1964. WR 117: 60
[Univ. Wis., Madison.] The trumpeter swan (Olor buccinator) formerly bred in Minn. east to the St. Louis River, in Ill. south to 38° N, and in northwestern Ind. Although it probably bred in Wis., full evidence is lacking.

Shearer, Leroy A., and Hans G. Uhlig. THE USE OF STOCK-WATER DUGOUTS BY DUCKS. J. Wildl. Mgmt. 29(1): 200-201. Jan. 1965. WR 117: 60
[SCS, Huron, S. Dak.] Abstract: Thirty-one stock-water dugouts in South Dakota and Minnesota were studied to determine the effect of resting rafts on their use by ducks. Observations indicated that dugouts modified by the addition of such resting rafts were more attractive to wild ducks than dugouts without them.

Simmons, K. E. L. BATHING BEHAVIOUR OF CANADA GEESE. British Birds 58 (2): 58-60. Feb. 1965. WR 117: 60
[11 Ash Grove, Clevedon, Somerset, England.] Somersaulting is described as a component of bathing behavior. It is postulated that somersaulting increases the wetting effect in water-bathing.

Trainer, Daniel O., and Richard A. Hunt. LEAD POISONING OF WATERFOWL IN WISCONSIN. J. Wildl. Mgmt. 29(1): 95-103, 1 fig. Jan. 1965. WR 117: 60
[Univ. Wis., Madison.] Abstract: The presence, prevalence, and significance of lead poisoning as a mortality factor of wild waterfowl in Wisconsin is reviewed. Since 1940, more than 1,700 Canada geese (Branta canadensis) have succumbed to lead poisoning in Wisconsin. This surpasses the total Canada goose mortality due to lead poisoning reported in the literature for North America. Although the majority of lead poisoning outbreaks among geese occurred in the spring, total mortality was equally distributed between fall and spring outbreaks. Lead poisoning mortality among whistling swans (Olor columbianus) in Wisconsin annually takes a small number of the spring migrating population. Seven duck species were known victims of lead poisoning in Wisconsin, but this disease was not considered an important mortality factor of ducks in the state. The mallard (Anas platyrhynchos) was the major target of the disease. Some of the ecological factors found to be involved with lead poisoning of waterfowl in Wisconsin were climate, water levels, soil types, diet, and the timing of waterfowl migrations. The signs, pathological lesions, epizootiology, and significance of lead poisoning of waterfowl in Wisconsin were considered and discussed.

Tyler, C. A STUDY OF THE EGG SHELLS OF THE ANATIDAE. Proc. Zool. Soc. London 142(4): 547-583, 14 figs. + 5 pls. June 1964. WR 117: 60
[The University, Reading, England.] Egg shells of different species of waterfowl were compared through the use of histological tests, plastic embedding techniques, chemical analyses, and polarized light studies.

Uspenskii, S. M. [THE BRANT GOOSE (BRANTA BERNICLA L.) IN THE USSR.] Migratsii zhivotnyk. Akad. Nauk SSSR (Moscow) 1: 124-138. 1959. [From Biol. Abstr. 45(9), 1964, from Referat. Zhur., Biol., 1960, no. 40237. Transl. of Russian abstr.] WR 117: 61

Weidmann, U. "COLOUR PREFERENCE" AND PECKING RESPONSE IN YOUNG MOORHENS GALLINULA CHLOROPUS AND COOTS FULICA ATRA. Ibis 107(1): 108-110. Jan. 1965. WR 117: 61
[Birkbeck Coll., Malet St., London, W.C. 1, England.] Young moorhens pecked red and yellow rods and coots pecked yellow rods more often than black, white or blue.

Zajac, Ryszard. ŁABĘDŹ NIEMY, CYGNUS OLOR (GMELIN) W POLNOCNOZACHODNIEJ POLSCE. [THE MUTE SWAN, CYGNUS OLOR (GMELIN) IN NORTHWESTERN POLAND.] Acta Ornithol. (Warsaw) 7(8): 221-252, illus. 1963. [From Biol. Abstr. 45(11), 1964. In Polish with Russian and English summ.] WR 117: 61
[Stacja Ornitol. I. Z., Polish Acad. Sci., Gdansk, Poland.]

CRANES, RAILS, SHOREBIRDS

Beer, C. G. CLUTCH SIZE AND INCUBATION BEHAVIOR IN BLACK-BILLED GULLS (LARUS BULLERI). Auk 82(1): 1-18, 3 figs. Jan. 1965. WR 117: 61
[Rutgers Univ., Newark, N. J.] Incubating birds were more restless when on clutches with more or fewer than three eggs.

Bruun, Bertel. SVARTBAGEN (LARUS MARINUS L.) I DANMARK. EN UNDERSØGELS BASERET PÅ RINGMAERKNINGER AF SKANDINAVSKE SVARTBAGE. [THE GREAT BLACK-BACKED GULL (LARUS MARINUS L.) IN DENMARK.] Dansk Ornithol. Forenings Tidsskr. 57 (2): 94-98, maps. 1963. [From Biol. Abstr. 45(10), 1964. In Danish with English summ.] WR 117: 61

Carrick, R., and M. D. Murray. SOCIAL FACTORS IN POPULATION REGULATION OF THE SILVER GULL, LARUS NOVAEHOLLANDIAE STEPHENS. CSIRO Wildl. Res. 9(2): 189-199 + 6 pls. Nov. 1964. WR 117: 61
[Div. Wildl. Res., CSIRO, Canberra, Australia.] Summary: Intraspecific hostility in the silver gull, Larus novaehollandiae, occurs at the individual level in relation to all its activities. The degree of dispersion that results varies from close range during resting to various distances in different feeding situations and territorial colonialism during breeding. It is suggested that the factor primarily responsible for limiting colony size is food supply within foraging range, and that feeding rights gained through hostility between individuals, not competition for nesting sites, determine which birds can breed.

Hailman, Jack P. THE GALÁPAGOS SWALLOW-TAILED GULL IS NOCTURNAL. Wilson Bull. 76(4): 347-354, 2 figs. Dec. 1964. WR 117: 61
[Inst. Animal Behavior, 31 Fulton St., Newark, N. J.] Summary: Larus furcatus is the only nocturnal gull. Nesting adults fly to sea at night, only returning to feed young or guard and incubate at the nest. They display mostly at dawn and dusk. Possible adaptations to nocturnal existence include: white plumage prominent in displays, including a white "releaser" on the bill for the chick's pecking; large eyes with a tapetum-like coating and reduced pecten; the primary diet of squid (which surface only at night); and, possibly, the unique clicking calls. Nocturnal habits may have evolved to allow adults to stand guard at the nest during the day when the diurnal Frigate Birds (Fregata) patrol the colonies.

Harris, M. P. THE FOOD OF SOME LARUS GULLS. Ibis 107(1): 43-53, 1 fig. Jan. 1965. WR 117: 61
[Edward Grey Inst., Oxford, England.] Food habits of the herring gull (Larus argentatus), lesser black-backed gull (L. fuscus), and great black-backed gull (L. marinus), based on analyses of stomach contents, pellets and direct observations.

Holmes, Richard Turner. BREEDING ECOLOGY AND ANNUAL CYCLE OF THE RED-BACKED SANDPIPER, CALIDRIS ALPINA PACIFICA. Ph.D. thesis, Univ. Calif. 223 p. 1964. [From abstr. in Dissertation Abstr. 25(7), 1965.] WR 117: 62

Kale, Herbert W., II, George W. Sciple, and Ivan R. Tomkins. THE ROYAL TERN COLONY OF LITTLE EGG ISLAND, GEORGIA. Bird-Banding 36(1): 21-27, 2 figs. Jan. 1965. WR 117: 62

[Encephalitis Res. Center, 4001 Tampa Bay Blvd., Tampa, Fla.] The royal tern (Thalasseus maximus) nests on barren or sparsely vegetated sand islands some distance from larger islands or the mainland. Suitable sites are formed by storms and tidal action before the breeding season, and nesting success is possible only if these island-building forces cease before the onset of the nesting season. Little Egg Island has the only breeding colony of these terns on the Georgia coast. This colony has a low reproductive success, probably due to the wide tidal range of 6-10 feet.--From summ.

Knoder, Eugene. PROPAGATION OF SANDHILL CRANES IN CAPTIVITY. Modern Game Breeding 1(1): 14-16, 30, illus. Nov. 1964. WR 117: 62

[105 Lyell St., Monte Vista, Colo.] Contains material reprinted from a progress report on the sandhill crane rearing program of the U. S. Fish and Wildlife Service.

Lind, Hans. NOGLE SOCIALE REAKTIONER HOS TERNER. [NOTES ON SOCIAL BEHAVIOUR IN TERNS.] Dansk Ornithol. Forenings Tidsskr. 57(3): 155-175, illus. 1963. [From Biol. Abstr. 45(12), 1964. In Danish with English summ.] WR 117: 62

[Zool. Lab., Univ. Copenhagen, Copenhagen, Denmark.]

Locke, Louis N., William H. Stickel, and Shirley A. Geis. SOME DISEASES AND PARASITES OF CAPTIVE WOODCOCKS. J. Wildl. Mgmt. 29(1): 156-161, 3 figs. Jan. 1965. WR 117: 62

[Patuxent Wildl. Res. Center, Laurel, Md.] Abstract: Observations were made concerning the diseases and parasites of a group of woodcocks (Philohela minor) caught in Massachusetts in the summer of 1960 and kept in captivity in Maryland, and of another group caught and kept in Louisiana in the winter of 1960-61. Bumblefoot, a granulomatous swelling of the foot caused by Micrococcus sp., is reported for woodcocks for the first time. Six of 31 woodcocks were infected with a renal coccidium of an undetermined species. Tetrameres sp. was found in 4 of 31 birds examined. Sarcocystis was found in one bird. Aerosaculitis was found in several.

Martin, Fant W., Aelred D. Geis, and William H. Stickel. RESULTS OF WOODCOCK WING COLLECTIONS, 1959 TO 1965. J. Wildl. Mgmt. 29(1): 121-131. Jan. 1965. WR 117: 62

[N. Mex. State Univ., Las Cruces.] Abstract: During hunting seasons from 1959 to 1962, age and sex determined from 45,444 wings were used to measure annual productivity of woodcocks (Philohela minor). Age of birds was determined by pattern and color of secondaries and by wear on primaries. Sex was determined by width and length of primaries. Overall age ratios, weighted by kill estimates, were the same each year and indicated no change in annual productivity. Immature sex ratios in the combined kill were nearly even each year, but kill of adult females was much larger than kill of adult males. The difference in sex ratios between immatures and adults thus suggests higher mortality of males than females after the first hunting season. Since woodcocks are promiscuous, an unbalanced adult sex ratio in favor of females probably does not reduce productivity. There are, however, factors affecting reliability of information deduced from wing collections, and further research is necessary to answer questions on differential vulnerability and mortality rates.

Meanley, Brooke. KING AND CLAPPER RAILS OF BROADWAY MEADOWS. Del. Conserv. 9(1): 3-7, illus. Winter 1965. WR 117: 63

[Patuxent Wildl. Res. Center, Laurel, Md.] A well-illustrated popular article containing much information on the biology and ecology of king (Rallus elegans) and clapper rails (R. longirostris).

Murray, M. D., and R. Carrick. SEASONAL MOVEMENTS AND HABITATS OF THE SILVER GULL, LARUS NOVAEHOLLANDIAE STEPHENS, IN SOUTH-EASTERN AUSTRALIA. CSIRO Wildl. Res. 9(2): 160-188, 7 figs. + 4 pls. Nov. 1964. WR 117: 63

[Div. Animal Health, CSIRO, Sydney, Australia.] Dispersal from colonies varies widely in proportion of birds involved, presumably according to the winter food resources of the breeding area, and in direction and distance, which are determined by the location of survival areas. There is no geographical cline. Constancy of return by young and breeding adults to their own colony is high.--From summ.

Post, Peter W., and Gilbert S. Raynor. RECENT RANGE EXPANSION OF THE AMERICAN OYSTERCATCHER INTO NEW YORK. Wilson Bull. 76(4): 339-346, 2 figs. Dec. 1964. WR 117: 63

[575 West 183 St., New York, N. Y.] Summary: A northward expansion of the breeding range of the American Oystercatcher began from Virginia in about the late 1930's and reached New York two decades later. The species has now nested in three distinct areas of Long Island. These breeding areas which differ from each other and from breeding areas in the species' southern range and the nesting occurrences are described. The ecological suitability of the Middle Atlantic coastline for this species is discussed and reproductive success is reported.

Skokova, N. N. [RESULTS OF BANDING IBIDIDAE AND ARDEIDAE BIRDS IN THE USSR.] Migratsii Zhivotnykh. Akad. Nauk SSSR (Moscow) 1: 67-94. 1959. [From Biol. Abstr. 45(10), 1964, from Referat. Zhur., Biol., 1960, no. 56022. Transl. of Russian abstr.] WR 117: 63

From 1927-1955 there were 15,084 banded wading birds in the USSR, belonging to 9 spp. Only the chicks were banded.

Stickel, William H., William G. Sheldon, and Lucille F. Stickel. CARE OF CAPTIVE WOODCOCKS. J. Wildl. Mgmt. 29(1): 161-172. Jan. 1965. WR 117: 63

[Patuxent Wildl. Res. Center, Laurel, Md.] Abstract: Numbers of American woodcocks (Philohela minor) were held in cages for experimental work lasting several months. Injuries caused by birds attempting to flush were greatly reduced by clipping feathers from one wing, by making cage walls opaque, and by using high cages or false ceilings of fabric. Size of cage was found not to be important, to judge from weight changes, so long as ample food was unmistakably available. Birds were kept in both large and small cages without social conflicts. Cages on the ground proved too unsanitary for long-term use; small steel cages with removable floors were practical but did not solve the sanitation problem. Living earthworms (Lumbricus terrestris) were provided daily in amounts roughly equal to weights of birds. Birds gained on this food when worms were offered in suitable ways. The feeding tray recommended is a large roasting pan with a snap-on metal rim that retards loss of worms. Trays contained moist peat in which birds probed for worms. Two efforts to keep woodcocks on a diet of red worms (Eisenia foetida) were unsuccessful; use of this worm was considered responsible. Woodcocks were handled and transported for short periods with least injury to them when they were rolled individually in soft bags.

Taverner, J. H. OBSERVATIONS ON BREEDING SANDWICH AND COMMON TERNS. British Birds 58(1): 5-9. Jan. 1965. WR 117: 63

Common terns (Sterna hirundo) did not join black-headed gulls (Larus ridibundus) in mobbing human intruders at their nesting colonies, but Sandwich terns (S. sandvicensis) staged attacks irrespective of the presence of black-headed gulls.

Timmerman, A. HULP AAN ZWARTE STERNS (CHLIDONIAS NIGER). [RENDERING ASSISTANCE TO THE BLACK TERN, CHLIDONIAS NIGER.] Levende Nat. 64(10): 234-237, illus. 1961. [From Biol. Abstr. 45(10), 1964. In Dutch.] WR 117: 64

Abstract: The habitat the black tern needs for nesting is likely to change through a variety of factors. Too heavy vegetation made a pool in the Mastenbroekerpolder near Hasselt, Netherlands, unsuitable for a rookery of black terns, whereas neighboring pools offered insufficient nesting facilities. An effort was made to assist the terns by placing rush-mats in the water in a place where waterlilies and reeds offered protection. The terns made 30 nests on the mats. A similar experiment in another pool elsewhere failed, presumably because the black terns there still had sufficiently adequate nesting sites.

Walkinshaw, Lawrence H. THE AFRICAN CROWNED CRANES. Wilson Bull. 76(4): 355-377, 5 figs. Dec. 1964. WR 117: 64

[819 North Ave., Battle Creek, Mich.] With observations on the life history of the South African crowned crane (Balearica regulorum) and notes on B. pavonina.

HAWKS AND OWLS

Clement, Roland C. LAST CALL FOR THE BIRDS OF PREY. Audubon Mag. 67(1): 37. Jan.-Feb. 1965. WR 117: 64

[Natl. Audubon Soc., 1130 Fifth Ave., New York, N. Y.] A condensed version of an address by the author at the 1964 convention of the National Audubon Society. "The National Audubon Society has always had great faith in education as the preferred approach, but it seems fair to warn those who believe in hunting for sport that unless they join in helping to eliminate abuses of the gun the Society may soon reconsider its policy. It cannot allow abuse to eliminate a species."

Egorov, O. V. [DATA ON THE ECOLOGY OF THE PEREGRINE FALCON IN VERKHOYANSK. Nauchn. Soobshch. Yakutsk. Fil. Sibirsk. Otd. Akad. Nauk SSSR 1: 149-154. 1958. [From Biol. Abstr. 45(9), 1964, from Referat. Zhur., Biol., 1960, no. 100228. In Russian.] WR 117: 64

Enderson, James H. ROADSIDE RAPTOR COUNT IN COLORADO. Wilson Bull. 77(1): 82-83. Mar. 1965. WR 117: 64

[Colo. Coll., Colorado Springs.] Relative frequencies of 9 spp. of raptors tallied during 12 counts involving 1675 miles of travel are tabulated.

Galushin, V. M., B. S. Mironov, and T. I. Belaya. [DATA ON THE ECOLOGY OF BUTEO BUTEO IN MOSKOVSKAYA OBLAST'.] Uch. Zap. Mosk. Gos. Ped. Inst. Im. V. I. Lenina 186: 200-209. 1962. [From Biol. Abstr. 45(9), 1964, from Referat. Zhur., Biol., 1963, no. 19I125. Transl. of Russian abstr.] WR 117: 64

Heintzelman, Donald S. SPRING AND SUMMER SPARROW HAWK FOOD HABITS. Wilson Bull. 76(4): 323-330, 1 fig. Dec. 1964. WR 117: 64

[629 Green St., Allentown, Pa.] With a bibliography of 35 titles.

Herbert, Richard A., and Kathleen Green Skelton Herbert. BEHAVIOR OF PEREGRINE FALCONS IN THE NEW YORK CITY REGION. Auk 82(1): 62-94, 3 figs. Jan. 1965. WR 117: 64

[Liston Front Range Lighthouse, R. D. 2, Middletown, Del.] A report covering 30 years of observations on breeding and wintering of peregrine falcons in the New York City region. Eight to ten pairs of peregrine falcons (Falco peregrinus) nested and sixteen or more wintered in the region until the mid-1940's. Breeding discontinued in the early 1950's, and by 1961 the entire population was extirpated.

Karaev, M. [DATA ON THE FEEDING OF ASIO OTUS.] Trudy Turkmensk. Sel'skokhoz. Inst. 11(2): 109-111. 1962. [From Biol. Abstr. 45(9), 1964, from Referat. Zhur., Biol., 1963, no. 19I134. Transl. of Russian abstr.] WR 117: 65

Mansell, W. Dan. EAGLE NESTING SURVEY IN THE LAKE OF THE WOODS AREA. Canadian Audubon 27(1): 18-21, illus. Jan.-Feb. 1965. WR 117: 65
Observations on the 39 eagle nests and 63 osprey nests tabulated during summer 1964. Indicated population of eagles was one pair per 10 square miles for this northwestern Ontario area.

McLaughlin, Frank W. STATUS OF THE BALD EAGLE IN NEW JERSEY. N. J. Nature News 19(2): 66-75, illus. June 1964. WR 117: 65
[Ewing Ave., Franklin Lakes, N. J.] In Nov. 1958, the N. J. Audubon Soc. initiated a cooperative state-wide study of the population status and breeding success of the bald eagle in N. J. During the period 1959-1963 a total of 9 young were produced in 39 nests. In 1962 immatures made up 26% and in 1963 they made up 12% of the N. J. bald eagle population.

Miller, Alden H., Ian I. McMillan, and Eben McMillan. HOPE FOR THE CALIFORNIA CONDOR. Audubon Mag. 67(1): 38-41, illus. Jan.-Feb. 1965. WR 117: 65
[Univ. Calif., Berkeley.] The surviving population of California condors declined from approximately 60 in the late 1940's to 40 in 1964. The birds are still reproducing, and decline may be chiefly associated with illegal shooting and rodent poisoning activity.

Mueller, Helmut C., and Daniel D. Berger. A SUMMER MOVEMENT OF BROAD-WINGED HAWKS. Wilson Bull. 77(1): 83-84. Mar. 1965. WR 117: 65
[Univ. Wis., Madison.] On 26 June 1960, a total of 76 broad-winged hawks (Buteo platypterus) were counted traveling northward. At least 95% of the birds were determined to be subadults.

Ochapovskii, V. S. [SOME ASPECTS OF THE BIOLOGY OF PREDATORY BIRDS IN THE KRASNODAR KRAI DURING THE NON-NESTING PERIOD.] In: (Materials of the 3rd All Union Ornithological Conference, 1962.) L'vovsk. Univ. (L'vov) 2: 127-129. 1962. [From Biol. Abstr. 45(11), 1964, from Referat. Zhur., Biol., 1962, no. 9I164. Transl. of Russian abstr.] WR 117: 65

Solomonov, N. G., G. P. Larinov, and A. E. Pshennikov. [MATERIAL ON PREDATORY BIRD FAUNA OF CENTRAL YAKUTIA.] In: (Problems of zoological studies in Siberia.) Knigoizdat (Gorno-Altaisk). p. 221-222. 1962. [From Biol. Abstr. 45(10), 1964, from Referat. Zhur., Biol., 1963, no. 14I258. Transl. of Russian abstr.] WR 117: 65
Data on Falco peregrinus, F. tinnunculus, Milvus milvus and Haliaetus albicilla.

Sonin, V. D. [SOME MATERIAL ON THE DIET AND DISTRIBUTION OF PREDATORY BIRDS IN THE IRKUTSK OBLAST.] Izvest. Vost.-Sibirsk. Otd. Geog. Obshch. SSSR 60: 138-146. 1962. [From Biol. Abstr. 45(10), 1964, from Referat. Zhur., Biol., 1963, no. 14I257. Transl. of Russian abstr.] WR 117: 65
Data on Falco peregrinus, F. columbarius, F. subbuteo, F. tinnunculus, Corvus corone, Columba rupestris, Accipiter gentilis, A. nisus, A. virgatus, Buteo buteo, Strix uralensis, Asio otus, Otus scops and Bubo bubo.

Sulkava, Pertti. VORKOMMEN UND NAHRUNG DER WALDOHREULE, ASIO OTUS (L.), IN ILMAJOKI (EP) IN DEN JAHREN 1955-1963. [THE OCCURRENCE AND FOOD HABITS OF THE LONG-EARED OWL ASIO OTUS (L.), IN ILMAJOKI DURING 1955-1963.] Aquilo, Ser. Zool. 2: 41-47. 1965. In German. WR 117: 65

Sulkava, Seppo. ZUR NAHRUNGSBIOLOGIE DES HABICHTS, ACCIPITER GENTILIS (L.). [FEEDING BIOLOGY OF THE GOSHAWK, ACCIPITER GENTILIS (L.).] Aquilo, Ser. Zool. 3: 1-103, 17 figs. 1964. In German. WR 117: 66

Tatarinov, K. A. [ON THE DIET OF THE BARN OWL IN THE LVOV REGION.] In: (Materials of the 3rd All Union Ornithological Conference, 1962.) L'vovsk. Univ. (L'vov) 2: 210-211. 1962. [From Biol. Abstr. 45(12), 1964, from Referat. Zhur., Biol., 1962, no. 9I171. Transl. of Russian abstr.] WR 117: 66

White, Clayton M., and Heinrich K. Springer. NOTES ON THE GYRFALCON IN WESTERN COASTAL ALASKA. Auk 82(1): 104-105. Jan. 1965. WR 117: 66
[Univ. Utah, Salt Lake City.] On food habits, commensal nesting, and parasitism by tick (Ixodes howelli).

Willoughby, Ernest J., and Tom J. Cade. BREEDING BEHAVIOR OF THE AMERICAN KESTREL (SPARROW HAWK). The Living Bird / Third Annual of the Cornell Laboratory of Ornithology / 1964. p. 75-96, 11 figs. 1964. WR 117: 66
[Syracuse Univ., Syracuse, N. Y.]

BLACKBIRDS, STARLINGS, CROWS

Case, Neil A., and Oliver H. Hewitt. NESTING AND PRODUCTIVITY OF THE RED-WINGED BLACKBIRD IN RELATION TO HABITAT. The Living Bird / Second Annual of the Cornell Laboratory of Ornithology / 1963. p. 7-20, 2 figs. + illus. 1963. WR 117: 66
[Cornell Univ., Ithaca, N. Y.]

Garg, S. P., A. Zajanc, and R. A. Bankowski. THE EFFECT OF COBALT-60 ON STARLINGS (STURNUS VULGARIS VULGARIS). Avian Diseases 8(4): 555-561, 1 fig. Nov. 1964. WR 117: 66
[Univ. Calif., Davis.] Summary: Experiments were conducted to determine the effect of radiation from a slug of cobalt-60 on starlings. Single exposure of 1000 rads or more caused 100% mortality. Four exposures of 200 rads each, given once every twenty-four hours for a total of 800 rads, proved more lethal (72%) than the same exposure given at 7-day intervals (16%) or given as a single dose (56%). Extensive necrotic changes were observed in the bone marrow, spleen, and duodenum. The birds exposed to 600 and 300 rads showed hyperplastic changes which ultimately recovered completely. It is assumed that the death due to more exposure (1000 rads or more) resulted from the irreparable damages to the vital tissues.

Krivitskii, I. A. [THE BIOLOGY OF THE CARRION CROW IN THE STEPPES OF THE TSELINN DISTRICT.] In: (Problems of zoological studies in Siberia.) Knigoizdat (Gorno-Altaisk). p. 140-141. 1962. [From Biol. Abstr. 45(10), 1964, from Referat. Zhur., Biol., 1963, no. 14I246. Transl. of Russian abstr.] WR 117: 66

Lloyd, James A. SEASONAL DEVELOPMENT OF THE INCUBATION PATCH IN THE STARLING. Condor 67(1): 67-72, 2 figs. Jan.-Feb. 1965. WR 117: 66
[Albert Einstein Med. Center, Philadelphia, Pa.] Increases in vascularity of skin taken from the ventral abdominal surface of females were seen about one month before egg laying began. Marked increases in vascularity, development of edema, epithelial metaplasia and loss of feathers occurred a few days before egg laying, reached peak development about midway through incubation, and progressively declined after eggs hatched. In the male, development of the incubation patch followed a course similar to that of the female but in lesser degree. During the reproductive period, females taken from the study area always had an incubation patch, but incubation patches in males were seen only in nesting birds.--From summ.

Lugovoi, A. E., and Yu. V. Kurochkin. [THE GRAY CROW IN THE VOLGA DELTA.] Trudy Astrakhansk. Zapovednika 6: 135-143. 1962. [From Biol. Abstr. 45(11), 1964, from Referat. Zhur., Biol., 1963, no. 5I175. Transl. of Russian abstr.] WR 117: 67

Muhlmann, H. DREIJAHRIGE ERFAHRUNGEN BEIM EINSATZ DER PHONOAKUSTISCHEN METHODE ZUR STARENABWEHR IN DEN WEINBERGEN. [EXPERIENCE OF THREE YEARS IN USING THE PHONO-ACOUSTIC METHOD TO KEEP STARLINGS FROM THE VINEYARDS.] Wein-Wiss. 18(2): 75-84, illus. 1963. [From Biol. Abstr. 45(9), 1964. In German.] WR 117: 67
[Versuchsanst. Wein u. Gartenbau, Oppenheim, W. Germany.]

Payne, Robert B. CLUTCH SIZE AND NUMBERS OF EGGS LAID BY BROWN-HEADED COWBIRDS. Condor 67(1): 44-60, 4 figs. Jan.-Feb. 1965. WR 117: 67
[Museum Vertebrate Zool., Berkeley, Calif.] Cowbirds lay in clutches of 1-6 eggs, as many as 15 eggs in a breeding season. Intervals between clutches vary from a few days to a few weeks. The mean clutch size of 3.1 eggs has not increased in the evolution of the cowbird. "Both follicular growth rate and atresia limit clutch size by regulating the numbers of oocytes that mature in the ovary."

Vandenbergh, John G. THE EFFECTS OF PHOTOPERIOD ON TESTICULAR ACTIVITY AND AGGRESSIVE BEHAVIOR OF STARLINGS. J. Exptl. Zool. 156(3): 323-329, 1 fig. Aug. 1964. WR 117: 67
[U. S. Public Health Serv., San Juan, Puerto Rico.] Starlings maintained under short days during the breeding season displayed a higher level of aggression than birds maintained on long days. The testes of the short day birds were aspermic and showed little evidence of androgen production. Thus, these birds were highly aggressive in the apparent absence of androgens. It is suggested that gonadotropins, in response to photoperiodic stimulation, are directly involved in the regulation of such aggressive behavior.--From summ.

OTHER BIRDS

Abdulali, Humayun. ON THE FOOD AND OTHER HABITS OF THE GREATER FLAMINGO (PHOENICOPTERUS ROSEUS PALLAS) IN INDIA. J. Bombay Nat. Hist. Soc. 61(1): 60-68 + 2 pls. Apr. 1964. WR 117: 67

Adamyan, M. S. [CONTRIBUTION TO THE ECOLOGY OF THE WHITETHROATED NIGHTINGALE IRANIA GUTTURALIS GUER. IN THE ARMENIAN SSR.] Izvest. Akad. Nauk Armyansk. SSR Biol. Nauki 16(7): 68-83, illus. 1963. [From Biol. Abstr. 45 (9), 1964. In Russian with Armenian summ.] WR 117: 67

Ash, J. S. THE 'RAPTOR-FLIGHT' OF THE CUCKOO. British Birds 58(1): 1-5. Jan. 1965. WR 117: 67
[Game Res. Assoc., Fordingbridge, Hampshire, England.] A method of flight adopted by cuckoos Cuculus canorus--apparently an adaptation to soaring flight used as an aid to the final pin-pointing of the nest of a potential fosterer--is remarkably like that of certain birds of prey, particularly sparrowhawks Accipiter nisus. The term 'raptor-flight' is coined to describe it.--From summ.

Bang, Beryl G. ANATOMICAL ADAPTATIONS FOR OLFACTION IN THE SNOW PETREL. Nature 205(4970): 513-515, 4 figs. 30 Jan. 1965. WR 117: 67
[Johns Hopkins Univ., Baltimore, Md.] "Pagodroma nivea."

Bligh, John, and T. Carr Hartley. THE DEEP BODY TEMPERATURE OF AN UNRESTRAINED OSTRICH STRUTHIO CAMELUS RECORDED CONTINUOUSLY BY A RADIO-TELEMETRIC TECHNIQUE. Ibis 107(1): 104-105, 1 fig. Jan. 1965. WR 117: 67
[A.R.C. Inst. Animal Physiol., Babraham, Cambridge, England.] During a 48-hour period, body temperature varied from 38.3 to 40.2 C, with a mean of 39.1 C.

Brazier, Frank H. STATUS OF THE MOCKINGBIRD IN THE NORTHERN GREAT PLAINS. Blue Jay 22(2): 63-75. June 1964. WR 117: 68

Chapin, James P. THE TOURACOS: AN AFRICAN BIRD FAMILY. The Living Bird / Second Annual of the Cornell Laboratory of Ornithology / 1963. p. 57-67, 10 figs. + 2 pls. 1963. WR 117: 68
[Am. Museum Nat. Hist., New York, N. Y.]

Clark, George A., Jr. LIFE HISTORIES AND THE EVOLUTION OF MEGAPODES. The Living Bird / Third Annual of the Cornell Laboratory of Ornithology / 1964. p. 149-167, 15 figs. 1964. WR 117: 68
[Univ. Wash., Seattle.]

Curio, Eberhard, and Peter Kramer. ON PLUMAGE VARIATION IN MALE DARWIN'S FINCHES / RESULTS OF THE GERMAN GALAPAGOS-EXPEDITION 1962/63. V. Bird-Banding 36(1): 27-44. Jan. 1965. WR 117: 68
[Lehrstuhl für Zoologie, 74 Tübingen, Beim Kupferhammer 8, Germany.] Color variations of plumage are age-related, and there is no evidence for polymorphism.

Dawson, William R. EVAPORATIVE WATER LOSSES OF SOME AUSTRALIAN PARROTS. Auk 82(1): 106-108. Jan. 1965. WR 117: 68
[Univ. Mich., Ann Arbor.]

Dunham, David Warren. BEHAVIOR OF THE ROSE-BREASTED GROSBEAK, PHEUCTICUS LUDOVICIANUS (LINNAEUS). Ph.D. thesis, Cornell Univ. 170 p. 1964. [From abstr. in Dissertation Abstr. 25(8), 1965.] WR 117: 68

Edwards, R. A. TREATMENT OF "WASHED-UP" PENGUINS. Bokmakiere 15(1): 8. 1963. [From Biol. Abstr. 45(9), 1964.] WR 117: 68
Oil contamination is the most frequent disability encountered among penguins stranded on our beaches. A detailed procedure involving rest, powder application, and de-oiling is described for this condition.

Fast, Arthur H. RETURNS ON AGED CARDINAL. Bird-Banding 36(1): 45. Jan. 1965. WR 117: 68
[4924 Rock Spring Road, Arlington, Va.] A banded male Richmondena cardinalis was 12.5 years old when last captured.

Gill, Douglas E., and Wesley E. Lanyon. ESTABLISHMENT, GROWTH, AND BEHAVIOR OF AN EXTRALIMITAL POPULATION OF HOUSE FINCHES AT HUNTINGTON, NEW YORK. Bird-Banding 36(1): 1-14, 4 figs. Jan. 1965. WR 117: 68
[Marietta Coll., Marietta, Ohio.] Observations on breeding behavior, movement, and variation in plumage coloration among Carpodacus mexicanus.

Greenhalgh, M. MIGRATING SWALLOWS AND MEADOW PIPITS DROWNING IN SEA. British Birds 58(1): 21-22. Jan. 1965. WR 117: 68
Two of eight swallows (Hirundo rustica) and four of seventeen meadow pipits (Anthus pratensis) disappeared into the sea while flying low over a choppy sea only a few yards from shore.

Hamilton, William J., III. SUN-ORIENTED DISPLAY OF THE ANNA'S HUMMINGBIRD. Wilson Bull. 77(1): 38-44, 1 fig. Mar. 1965. WR 117: 68
[Univ. Calif., Davis.] The aerial display of the Anna's hummingbird (Calypte anna) "is always oriented into the sun when the sky is clear.... Under overcast conditions the orientation of dives is no longer sun oriented." Limited observations suggest that orientation of the dive is based on shadows.--From summ.

King, James R., and Eugene E. Wales, Jr. PHOTOPERIODIC REGULATION OF TESTICULAR METAMORPHOSIS AND FAT DEPOSITION IN THREE TAXA OF ROSY FINCHES. Physiol. Zoöl. 38(1): 49-68, 4 figs. Jan. 1965. WR 117: 69

[Wash. State Univ., Pullman.] Comparisons of fat deposition in the three taxa indicate that the Hepburn rosy finch and gray-crowned rosy finch gain weight (deposit fat) equally in spring and when exposed to long photoperiods, but that the black rosy finch tends to gain slightly less. The differences, however, are not statistically significant. In order to account for the quantitative similarity of vernal fat deposition in the three taxa, we speculate that this metabolic adaptation evolved primarily in response to selection pressures favoring early seasonal occupancy of a calorically demanding alpine nesting environment. Migratory status apparently has exerted only a secondary effect.--From summ.

Lee, Chien Ping. WATER BALANCE IN THE ZEBRA FINCH, TAENIOPYGIA CASTANOTIS. Ph.D. thesis, Duke Univ. 91 p. 1964. [From abstr. in Dissertation Abstr. 25 (5), 1964.] WR 117: 69

It was concluded that the ability of the zebra finch to live without water under moderate temperature conditions was due to the following attributes: (1) it was able to produce droppings of very low water content; (2) it maintained a low respiratory evaporation relative to the oxygen consumption and (3) it was able to reduce its cutaneous evaporation when no water was available. Presumably these findings pertain to the ability of the zebra finch to thrive in the arid environment of Central Australia.

Markov, V. I. [PRESENT-DAY DISTRIBUTION AND ABUNDANCE OF SOME SPECIES OF ICHTHYOPHAGOUS BIRDS.] Okhrana Prirody & Ozelenenie (Moscow) 4: 103-105. 1960. [From Biol. Abstr. 45(10), 1964, from Referat. Zhur., Biol., 1963, no. 13I155. Transl. of Russian abstr.] WR 117: 69

Abstract: The total USSR population, nesting in small colonies, includes about 600 pairs of Pelecanus onocrotalus, 650 to 700 pairs of P. crispus, 200 to 250 pairs of Phalacrocorax pygmaeus. The abundance of these spp. was reduced mainly as a result of the economic exploitation of reservoirs and direct extermination of the birds. The author recommends that hunting of the named spp. be prohibited and that reservations be established for them in the deltas of the Amu-Darya and Ili rivers.

Marshall, Trevor. SWALLOWS BUILDING NEST INSIDE BLACKBIRD'S. British Birds 58(1): 21. Jan. 1965. WR 117: 69

A successful nest of a swallow (Hirundo rustica) was built inside the nest of a blackbird (Turdus merula). The nest was in ivy on a wall about three feet above a river and had been used earlier the same season by the blackbirds.

Mengel, Robert M. THE PROBABLE HISTORY OF SPECIES FORMATION IN SOME NORTHERN WOOD WARBLERS (PARULIDAE). The Living Bird / Third Annual of the Cornell Laboratory of Ornithology / 1964. p. 9-43, 8 figs. 1964. WR 117: 69

[Univ. Kans., Lawrence.] The distributions and relationships of 46 continental and 2 insular species of forest-adapted wood warblers are considered in relation to the Tertiary and Pleistocene history of North America, and the implications to Pleistocene biogeography in general are briefly discussed.--From summ.

Norup, Svend. DANSKE PIBERES YNGLEBIOLOGI. 1. MARKPIBEREN (ANTHUS C. CAMPESTRIS (L.)). [BREEDING BIOLOGY OF DANISH PIPITS. 1. TAWNY PIPIT (ANTHUS C. CAMPESTRIS (L.)).] Dansk Ornithol. Forenings Tidsskr. 57(2): 110-117, illus. 1963. [From Biol. Abstr. 45(9), 1964. In Danish with English summ.] WR 117: 69

Pettingill, Olin Sewall, Jr. PENGUINS ASHORE AT THE FALKLAND ISLANDS. The Living Bird / Third Annual of the Cornell Laboratory of Ornithology / 1964. p. 45-64, 17 figs. 1964. WR

[Cornell Univ., Ithaca, N. Y.]

Rand, R. W. THE BIOLOGY OF GUANO-PRODUCING SEABIRDS. 4. COMPOSITION OF COLONIES ON THE CAPE ISLANDS. S. Africa Div. Sea Fish. Invest. Rept. 43: 1-32, illus. 1963. [From Biol. Abstr. 45(12), 1964.] WR 117: 70

Rand, R. W. THE BIOLOGY OF GUANO-PRODUCING SEABIRDS. 5. COMPOSITION OF COLONIES ON THE SOUTH WEST AFRICAN ISLANDS. S. Africa Div. Sea Fish. Invest. Rept. 46: 1-26, illus. 1963. [From Biol. Abstr. 45(12), 1964.] WR 117: 70

Richardson, Frank. BREEDING AND FEEDING HABITS OF THE BLACK WHEATEAR OENANTHE LEUCURA IN SOUTHERN SPAIN. Ibis 107(1): 1-16, 4 figs. + 2 pls. Jan. 1965. WR 117: 70
[Wash. State Museum, Seattle.]

Rowan, M. K. REGULATION OF SEA-BIRD NUMBERS. Ibis 107(1): 54-59. Jan. 1965. WR 117: 70
[Percy Fitzpatrick Inst. African Ornithol., Rondebosch, Cape Province, South Africa.] Availability of nest sites and food are considered not to be factors limiting population increase among sea birds. With clutch size reduced to one egg, the only remaining means for reducing rate of reproduction is by prolonging attainment of reproductive maturity. Onset of reproductive maturity may be density-related.

Schwartz, Paul. THE NORTHERN WATERTHRUSH IN VENEZUELA. The Living Bird / Third Annual of the Cornell Laboratory of Ornithology / 1964. p. 169-184, 6 figs. 1964. WR 117: 70
[Inst. Neotropical, Apartado 4640 Chacao, Caracas, Venezuela.]

Simms, Eric. EFFECTS OF THE COLD WEATHER OF 1962/63 ON THE BLACKBIRD POPULATION OF DOLLIS HILL, LONDON. British Birds 58(2): 33-43, 1 fig. Feb. 1965. WR 117: 70
[85 Brook Rd., Cricklewood, London, N.W. 2, England.] The cold weather of Jan. 1963 resulted in almost complete evacuation of the study area by blackbirds (Turdus merula), and the breeding population in 1963 was 55% below the usual population. During the winter of 1963-64, the population was still 35-40% below its usual level.--From summ.

Stager, Kenneth E. AN EXPOSED NOCTURNAL ROOST OF MIGRANT VAUX SWIFTS. Condor 67(1): 81-82, 1 fig. Jan.-Feb. 1965. WR 117: 70
[Los Angeles County Museum, Los Angeles, Calif.] A cluster of Vaux swifts (Chaetura vauxi) was observed and photographed roosting on the outside of the trunk of a tree. The birds appeared lifeless when on the tree but flew when plucked from the tree and thrown into the air. The observation was made soon after sunrise, and the temperature during the preceding night had been 37-38 F. The entire flock of swifts was on the wing within two hours after sunrise.

Stead, Philip J. PLIGHT PATTERNS OF THE EUROPEAN BUSTARDS. British Birds 58(2): 43-47, illus. Feb. 1965, WR 117: 70
[43 Roseberry Rd., Middlesborough, Yorkshire, England.] Characteristics for distinguishing the bustards (Otis tarda, O. tetrax, and Chlamydotis undulata) are discussed.

Stickel, David W. ROOSTING HABITS OF RED-BELLIED WOODPECKERS. Wilson Bull. 76(4): 382-383. Dec. 1964. WR 117: 70
[Holyoke Junior Coll., Holyoke, Mass.] Observations on nature of roosting places of Centurus carolinus, and behavior when going to and from them.

Swales, M. K. THE SEA-BIRDS OF GOUGH ISLAND. Ibis 107(1): 17-42, 2 figs. Jan. 1965. WR 117: 70
The first installment of an article on the birds of Gough Island, in the South Atlantic.

Ward, William V. THE SONGS OF THE APAPANE. The Living Bird / Third Annual of the Cornell Laboratory of Ornithology / 1964. p. 97-117, 23 figs., 1 pl. 1964. WR 117: 71
[2027 Ualakaa St., Honolulu, Hawaii.] "Himatione sanguinea"--Drepaniidae.

Williams, Lovett E., Jr. JAEGERS IN THE GULF OF MEXICO. Auk 82(1): 19-25, 2 figs. Jan. 1965. WR 117: 71
[Game & Fresh Water Fish Comm., Tallahassee, Fla.] Data are given demonstrating that the three jaegers (Stercorarius pomarinus, S. parasiticus, and S. longicaudus) are more abundant in the Gulf of Mexico than is indicated by the 1957 edition of the A.O.U. Checklist.

REPTILES AND AMPHIBIANS

Alexander, Taylor R. OBSERVATIONS ON THE FEEDING BEHAVIOR OF BUFO MARINUS (LINNE). Herpetologica 20(4): 255-259, 2 figs. 25 Jan. 1965. WR 117: 71
[Univ. Miami, Coral Gables, Fla.] Unconfined toads ate dog food and table scraps from a dish at all hours of the day and night.

Anderson, Jer. And. A REPORT ON THE GECKO TERATOLEPIS FASCIATA (BLYTH, 1853). J. Bombay Nat. Hist. Soc. 61(1): 161-171, 3 figs., 1 map + 2 pls. Apr. 1964. WR 117: 71
[Royal Scottish Museum, Edinburgh, Scotland.] Covers behavior, reproduction, and food habits.

Bachmann, Marilyn Dorothy Davidson. MATERNAL BEHAVIOR OF THE RED-BACKED SALAMANDER, PLETHODON CINEREUS. Ph.D. thesis, Univ. Mich. 170 p. 1964. [From abstr. in Dissertation Abstr. 25(8), 1965.] WR 117: 71
It was concluded that the female remains with the eggs throughout the nesting season and is probably, but not necessarily, the one which laid the eggs. She leaves the cavity permanently only after the young have left (about two weeks). Her presence reduces the tendency of eggs to mold and provides protection from predators for both eggs and young.

Bellis, Edward D. HOME RANGE AND MOVEMENTS OF THE WOOD FROG IN A NORTHERN BOG. Ecology 46(1&2): 90-98, 3 figs. Winter 1965. WR 117: 71
[Pa. State Univ., University Park.] Based on 1,377 individuals handled. The mean home range size of marked wood frogs (Rana sylvatica) was 77.2 square yards. Of the frogs recaptured in the year after marking, 50% moved 15 yards or less, and 78% moved 32 yards or less.

Blair, W. Frank. ISOLATING MECHANISMS AND INTERSPECIES INTERACTIONS IN ANURAN AMPHIBIANS. Quart. Rev. Biol. 39(4): 334-344, 6 figs. Dec. 1964. WR 117: 71
[Univ. Texas, Austin.]

Bokermann, Werner C. A. FIELD OBSERVATIONS ON THE HYLID FROG OSTEOCEPHALUS TAURINUS FITZ. Herpetologica 20(4): 252-255. 25 Jan. 1965. WR 117: 71
[Rua Anita Garibaldi n. 45, São Paulo, Brazil.] Chiefly on breeding behavior.

Boyer, Don R. ECOLOGY OF THE BASKING HABIT IN TURTLES. Ecology 46(1&2): 99-118, 10 figs. Winter 1965. WR 117: 71
[Washburn Univ., Topeka, Kans.] "Basking serves primarily as a method of thermal control, with secondary benefits in drying of the skin and shell."

Brame, Arden H., Jr., and David B. Wake. THE SALAMANDERS OF SOUTH AMERICA. Los Angeles County Museum Contr. Sci. 69: 1-72. 1963. [From Biol. Abstr. 45 (11), 1964.] WR 117: 71
[Univ. S. Calif., Los Angeles.] A resume of all previous work on South American salamanders, including an historical taxonomic survey, is given. All recognizable taxa are described or redescribed. Evolutionary relationships are discussed and a hypothesis concerning the origin of Latin American salamander genera of the family Plethodontidae is presented with special emphasis upon the entry into South America.

Caldwell, David K. COMMENTS ON THE NESTING BEHAVIOR OF ATLANTIC LOGGERHEAD SEA TURTLES, BASED PRIMARILY ON TAGGING RETURNS. Quart. J. Fla. Acad. Sci. 25 (4): 287-302. 1962. [From Biol. Abstr. 45(11), 1964.] WR 117: 72
[Los Angeles County Museum, Los Angeles, Calif.] Abstract: The present status of Atlantic loggerhead, Caretta caretta (L.), sea turtle nesting on south Georgia beaches is discussed. Data are included which substantiate earlier evidence that individuals nest several times on the same stretch of beach during a single season; groups of turtles apparently nest together several times; a turtle interrupted in nesting returns on the same or successive nights until she nests successfully; the usual interval between nestings within the season is 12 to 15 days. Data on typical nesting intervals, both long and short, are presented, and further evidence for real group movements is considered. A typical individual nesting behavior is described.

Davis, William B., and James R. Dixon. AMPHIBIANS OF THE CHILPANCINGO REGION, MEXICO. Herpetologica 20(4): 225-233. 25 Jan. 1965. WR 117: 72
[Texas A & M Univ., College Station.] Annotated list of 34 spp.

Davis, William C., and Victor C. Twitty. COURTSHIP BEHAVIOR AND REPRODUCTIVE ISOLATION IN THE SPECIES OF TARICHA (AMPHIBIA, CAUDATA). Copeia 1964 (4): 601-610, 7 figs. 31 Dec. 1964. WR 117: 72
[Stanford Univ., Stanford, Calif.]

Doucet, Jean. LES SERPENTS DE LA RÉPUBLIQUE DE CÔTE D'IVOIRE. [THE SERPENTS OF THE REPUBLIC OF THE IVORY COAST.] Acta Trop. 20(4): 297-340, illus. 1963. [From Biol. Abstr. 45(11), 1964. In French.] WR 117: 72
[Off. Rech. Sci. & Tech. Outre-Mer, Abidjan, Ivory Coast.]

Hahn, William E., and Donald W. Tinkle. FAT BODY CYCLING AND EXPERIMENTAL EVIDENCE FOR ITS ADAPTIVE SIGNIFICANCE TO OVARIAN FOLLICLE DEVELOPMENT IN THE LIZARD UTA STANSBURIANA. J. Exptl. Zool. 158(1): 79-85, 1 fig. Feb. 1965. WR 117: 72
[Tulane Univ., New Orleans, La.] "Fat storage in abdominal vesicles is characteristic of all temperate zone reptiles that we have examined.... Our results indicate that the fat body cycle in U. stansburiana has its primary adaptive significance as an aid to early (in the season) reproduction."

Heatwole, Harold. CONTRIBUCIÓN A LA HISTORIA NATURAL DE ELEUTHERODACTYLUS TERRAEBOLIVARIS (ANURA). [CONTRIBUTION TO THE NATURAL HISTORY OF ELEUTHERODACTYLUS TERRAEBOLIVARIS (ANURA).] Acta Biol. Venezuelica 3(20): 301-313, illus. 1963. [From Biol. Abstr. 45(10), 1964. In Spanish with English summ.] WR 117: 72
[Univ. Puerto Rico, Rio Piedras, Puerto Rico.]

Heatwole, Harold, Nelson Mercado, and Evelina Ortiz. COMPARISON OF CRITICAL THERMAL MAXIMA OF TWO SPECIES OF PUERTO RICAN FROGS OF THE GENUS ELEUTHERODACTYLUS. Physiol. Zool. 38(1): 1-8, 2 figs. Jan. 1965. WR 117: 72
[Univ. Puerto Rico, Rio Piedras, Puerto Rico.]

Hildebrand, Henry H. HALLAZGO DEL ÁREA DE ANIDACIÓN DE LA TORTUGA MARINA "LORA", LEPIDOCHELYS KEMPI (GARMAN), EN LA COSTA OCCIDENTAL DEL GOLFO DE MÉXICO. [DISCOVERY OF THE NESTING SITE OF THE RIDLEY SEA TURTLE ON THE WEST COAST OF THE GULF OF MEXICO.] Ciencia (Mexico) 22(4): 105-112, illus. 1963. [From Biol. Abstr. 45(9), 1964. In Spanish.] WR 117: 72
[Univ. Corpus Christi, Corpus Christi, Texas.]

Hirth, Harold F. TEMPERATURE PREFERENCES OF FIVE SPECIES OF NEOTROPICAL LIZARDS. Herpetologica 20(4): 273-276. 25 Jan. 1965. WR 117: 72
[Univ. Utah, Salt Lake City.] The results support the conclusions of earlier workers that congeners have similar thermal preferences and that thermal sensitivity, habitat, and behavior are interrelated.--From summ.

Hutchison, Victor H., and Richard J. Kosh. THE EFFECT OF PHOTOPERIOD ON THE CRITICAL THERMAL MAXIMA OF PAINTED TURTLES (CHRYSEMYS PICTA). Herpetologica 20(4): 233-238, 1 fig. 25 Jan. 1965. WR 117: 73

[Univ. R. I., Kingston.] Summary: Painted turtles (Chrysemys picta) acclimated to a 16-hour photoperiod (16L) at 10°, 20°, and 30°C. had significantly higher critical thermal maxima (CTM) than those acclimated to an 8-hour photoperiod (8L) at the same acclimation temperatures. The difference between the mean CTM of 8L and 16L groups decreased with increased acclimation temperatures; thus, increased photoperiod appears to be slightly more effective in raising thermal tolerances at lower acclimation temperatures. An increase in the photoperiod from 8L to 16L produces an increase in the CTM equivalent to an increase in the acclimation temperature of 4.8°C. at 10°C. and, 3.2°C. at 20°C. Such a photoperiodic response would be of adaptive value.

Johnson, Shelly R. AN ECOLOGICAL STUDY OF THE CHUCKWALLA, SAUROMALUS OBESUS BAIRD, IN THE WESTERN MOJAVE DESERT. Am. Midland Nat. 73(1): 1-29, 15 figs. Jan. 1965. WR 117: 73

[Univ. S. Calif., Los Angeles.] A marked population of chuckwallas, Sauromalus obesus, was the object of an ecological study in the western Mojave Desert during three activity seasons. The results include data on diel and seasonal activity, reproduction, size, growth, age, sexual dimorphism, molting, population dynamics, and feeding. Members of a second population located during the last year of study were collected to supplement the data on reproduction and to provide specimens for a color and pattern analysis.--From abstr.

Kessel, Brina. BREEDING DATES OF RANA SYLVATICA AT COLLEGE, ALASKA. Ecology 46(1&2): 206-208. Winter 1965. WR 117: 73

[Univ. Alaska, College.] In 12 years of observation, spring starting times of vocalizations have varied from 24 April to 18 May.

Klimstra, W. D., and Charles W. Myers. FOODS OF THE TOAD, BUFO WOODHOUSEI FOWLERI HINCKLEY. Trans. Ill. State Acad. Sci. 58(1): 11-26, 3 figs. 1965. WR 117: 73

[Coop. Wildl. Res. Lab., Southern Ill. Univ., Carbondale.]

Licht, Paul. THE RELATION BETWEEN THERMOREGULATION AND PHYSIOLOGICAL ADJUSTMENTS TO TEMPERATURE IN LIZARDS. Ph.D. thesis, Univ. Mich. 107 p. 1964. [From abstr. in Dissertation Abstr. 25(7), 1965.] WR 117: 73

Involves studies on Dipsosaurus dorsalis, Uma notata, Sceloporus graciosus, S. undulatus, Tiliqua rugosa, Urosaurus ornatus, Anolis carolinensis, Gerrhonotus multicarinatus, Amphibolurus ornatus, Egernia carinata, Eumeces obsoletus, and Gymnodactylus milii.

Marx, Hymen, and George B. Rabb. RELATIONSHIPS AND ZOOGEOGRAPHY OF THE VIPERINE SNAKES (FAMILY VIPERIDAE). Fieldiana: Zoology 44(21): 161-206, 46 figs. 16 Feb. 1965. WR 117: 73

[Chicago Nat. Hist. Museum, Chicago, Ill.]

Milstead, William W. CHANGES IN COMPETING POPULATIONS OF WHIPTAIL LIZARDS (CNEMIDOPHORUS) IN SOUTHWESTERN TEXAS. Am. Midland Nat. 73(1): 75-80. Jan. 1965. WR 117: 73

[Univ. Mo. Kansas City, Kansas City.] Abstract: Population dynamics of whiptail lizards were studied at the Black Gap Wildlife Management Area, Brewster Co., Texas, in 1951 and 1952. Some of these studies were repeated in 1962. In the decade between the studies, Black Gap recovered from the effects of a severe drought. Changes in the lizard populations consisted of changes in population densities and in diet. Cnemidophorus tigris showed an increased density in the ecological association dominated by it in 1952 and also increased densities in the associations dominated by the other two species of the area in 1952. Cnemidophorus septemvittatus and C. inornatus which equalled tigris in numbers in 1952 are now quite rare. Changes in diet consisted primarily of a higher percentage of caterpillars and a lower percentage of termites in 1962 than in 1952.

Norris, Kenneth S., and William R. Dawson. OBSERVATIONS ON THE WATER ECONOMY AND ELECTROLYTE EXCRETION OF CHUCKWALLAS (LACERTILIA, SAUROMALUS). Copeia 1964(4): 638-646, 3 figs. 31 Dec. 1964. WR 117: 74
[Univ. Calif., Los Angeles.]

Pyburn, William F. OBSERVATIONS ON THE LIFE HISTORY OF THE TREEFROG, PHYLLOMEDUSA CALLIDRYAS (COPE). Texas J. Sci. 15(2): 155-170. 1963. [From Biol. Abstr. 45(9), 1964.] WR 117: 74
[Arlington State Coll., Arlington, Texas.]

Ream, Catherine H. NOTES ON THE BEHAVIOR AND EGG LAYING OF CORYTHOPHANES CRISTATUS. Herpetologica 20(4): 239-242, 1 fig. 25 Jan. 1965. WR 117: 74
[Univ. Wis., Madison.] A lizard from Barro Colorado Island, Panama.

Samalova, Alena. PRÍSPEVEK K POZNÁNÍ SVLÉKÁNÍ KŮZE U MLOKA ZEMNÍHO (SALAMANDRA SALAMANDRA L.) [A CONTRIBUTION TO THE KNOWLEDGE OF SHEDDING THE SKIN OF SALAMANDRA SALAMANDRA L.] Ziva 9(3): 112-113, illus. 1961. [From Biol. Abstr. 45(9), 1964. In Czech.] WR 117: 74

Shoemaker, Vaughan Hurst. PHYSIOLOGICAL EFFECTS OF WATER DEPRIVATION IN A TOAD, BUFO MARINUS. Ph.D. thesis, Univ. Mich. 104 p. 1964. [From abstr. in Dissertation Abstr. 25(6), 1964.] WR 117: 74

Tamsitt, J. R., and Darío Valdivieso. THE HERPETOFAUNA OF THE CARIBBEAN ISLANDS SAN ANDRES AND PROVIDENCIA. Rev. Biol. Tropical 11(2): 131-139. 1963. WR 117: 74
[Univ. Puerto Rico, San Juan.] An annotated list of 14 spp.

Telford, Sam Rountree, Jr. A COMPARATIVE STUDY OF ENDOPARASITISM AMONG SOME SOUTHERN CALIFORNIA LIZARD POPULATIONS. Ph.D. thesis, Univ. Calif. 279 p. 1964. [From abstr. in Dissertation Abstr. 25(5), 1964.] WR 117: 74

Urban, Emil Karl. A COMPARATIVE STUDY OF LOCOMOTION IN SOME TEIID LIZARDS. Ph.D. thesis, Univ. Wis. 187 p. 1964. [From abstr. in Dissertation Abstr. 25(6), 1964.] WR 117: 74
Analysis of head, leg and body movements as observed in motion pictures.

Weiner, Nancy J., and Hobart M. Smith. COMPARATIVE OSTEOLOGY AND CLASSIFICATION OF THE CROTAPHYTIFORM LIZARDS. Am. Midland Nat. 73(1): 170-187, 6 figs. Jan. 1965. WR 117: 74
[Univ. Alberta, Edmonton, Alberta, Canada.]

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